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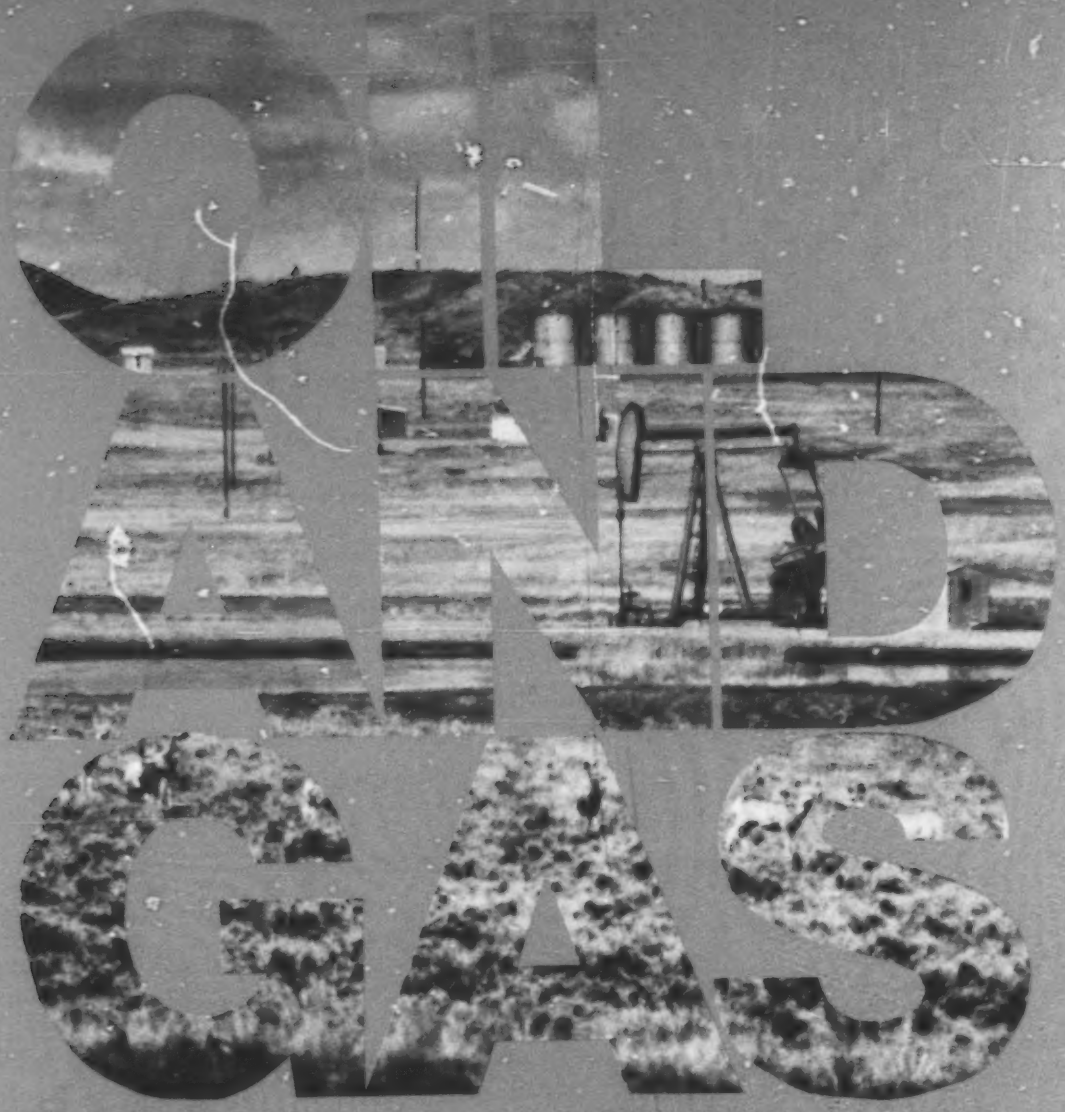

SURFACE OPERATING STANDARDS FOR OIL AND GAS EXPLORATION AND DEVELOPMENT

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United States Department of the Interior
Bureau of Land Management
and
United States Department of Agriculture
Forest Service

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Copies of this brochure are available in limited quantities, free of charge, from RMRCC member BLM State Offices or FS member Regional Offices. These member offices are identified on the map on page 45 of this brochure. This brochure has been developed for use primarily in the Rocky Mountain States area.

Surface Operating Standards for Oil and Gas Exploration and Development "Gold Book"

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INTRODUCTION

Federally owned oil and gas resources are located on lands administered by the Bureau of Land Management (BLM), the Forest Service (FS), other Federal Surface Management Agencies (SMAs), and on lands with non-Federal surface owner (split estate lands). Federal oil/gas lease operations are managed by the BLM in cooperation with the appropriate SMA or surface owner. On National Forest System lands, the FS has approval authority for the surface use portion of the Federal oil/gas operation.

Maps of Federal Jurisdiction:

Maps of the BLM State Offices and Regional Forest Service Offices are shown on page 45. The addresses and telephone numbers are also listed on page 45.

Purpose of Brochure

This brochure has been developed to aid the operator in permit approval and conduct of oil and gas operations on federal lands, from exploration to development and production, to abandonment. Information is provided for preparation of the surface use and drilling programs. This brochure also will prove useful in guiding oil and gas operators on Indian lands. However, early coordination with the BLM, and appropriate Bureau of Indian Affairs agency office is encouraged as situations vary by reservation or agency. This brochure is intended to give the operator general informational guidance on compliance with the operating requirements given in 43 CFR 3000, 36 CFR 228E and any Onshore Oil and Gas Orders or Notice to Lessees (NTLs) which have, or will be, promulgated or issued. For a more detailed discussion of specific procedures and requirements, the reader is directed to the Regulations, Onshore Orders, NTLs, and other agency direction currently in effect.

Every operation authorized under a federal oil and gas lease should conform to Bureau and Forest Service standards and reflect the relevant site-specific conditions. Knowledge of the BLM Resource Management Plans and FS Forest Plans, as well as agency operational standards, procedures and environmental protection requirements, will help an operator meet these standards.

Surface Management Agency

The lease will indicate whether the SMA is the BLM, FS or some other agency. When this information is not provided in the lease, the lessee should contact the BLM to determine the SMA involved.

Development on Privately Owned Surface

Where the surface is privately owned, the operator is responsible for reaching an agreement with the private surface owner. The agreement should set forth the requirements for the protection of surface resources and/or damages in lieu thereof. The BLM may request submission of the private agreement in areas where the surface of federal or Indian-owned lands in proximity to the proposed well site or access road would be significantly affected by actions on the private surface. If the agreement is not adequate to protect adjacent federal or Indian lands, the SMA may require additional protective measures. The SMA will not require construction standards or mitigation measures more stringent than those otherwise provided by applicable agency standards or plans. Each Application for Permit to Drill (APD) or application to conduct other surface disturbing activities shall contain the name, address, and, if known, telephone number of the private surface owner. The BLM shall invite the surface owner to participate in any onsite inspection that is held. In the absence of any agreement, the authorized officer may permit the operations provided the operator has complied with the provisions of the law and Federal regulations.

The operator is responsible for making access arrangements with the private surface owner prior to entry upon the lands for the purposes of surveying and staking of the well site location and/or access road. The operator may be required to obtain any necessary cultural resource or threatened and endangered species clearances. Any necessary inventories will be undertaken only with the consent of the private surface owner. However, if the private surface owner objects to either an inventory or any necessary mitigation, a written statement to that effect should be obtained from the surface owner. In any event, documentation of the reasons for the lack of survey and mitigation will be submitted by

the operator to the BLM or the involved SMA. The operator should be aware that inability to obtain permission to conduct a survey when required or to perform necessary mitigation does not relieve the SMA or BLM from its responsibilities as required by the National Environmental Policy Act (NEPA), the National Historic Preservation Act or the Endangered Species Act. The SMA must still prepare any necessary environmental document and initiate any necessary consultation with appropriate state or federal agencies. Operators should be aware of the potential for delays in project approval if extended consultation is required.

Filing Plans

Onshore Oil and Gas Order No. 1 describes the procedure for filing of either an Application for Permit to Drill (APD) or a Notice of Staking (NOS) followed by an APD. Early contact with the BLM and the SMA will expedite approval of the APD. This contact should be made prior to commitment of dates, equipment, access route acquisition and preparation of the APD.

Each APD must include a drilling plan and a surface use plan of operations. No operations are allowed without an approved APD. Request for changes from the approved APD must be submitted to the BLM.

Environmental Analysis

Upon receipt of a proposal for action, the BLM or SMA will conduct an environmental analysis and prepare an environmental document in compliance with the requirements of the NEPA and the regulations promulgated by the Council on Environmental Quality. The timing of the approval of the proposed action may be dependent upon the complexity of the analysis and the documentation required.

Onsite Inspection

An onsite predrill inspection may be conducted with the operator to identify resource protection concerns and requirements. Prior to, or in conjunction with, the onsite inspection, the SMA will advise the operator if any special inventories or studies are required, such as for cultural resources or threatened and endangered species.

Abandonment

All areas no longer needed for operations are to be reclaimed. All wells determined to be no longer productive or useful are to be properly plugged and abandoned. The BLM will not approve final abandonment until all terms and conditions have been met to the satisfaction of the BLM and the SMA.

Constraints

Constraints may be imposed on the location or timing of exploration, drilling or other operations. Constraints may result from lease stipulations or the SMA's review of the proposed operations. When consultation with the State Historic Preservation Office and/or the U.S. Fish and Wildlife Service is required, the time needed for APD review may be extended and may result in constraints on operations.

Other Federal, State, or Local Permits or Authorizations

A permit or authorization from the BLM or SMA will be required unless otherwise exempted by order or NTL for on-lease uses such as disposal of produced water, sand or gravel use, gas flaring, etc. Off-lease uses will require a permit or authorization by the SMA. All facilities on the lease owned by parties other than the operator also require a permit or authorization by the SMA.

Other Authorizations - BLM and SMA approval of an APD does not relieve the operator from obtaining any other authorizations required for drilling or subsequent operations. This includes requirements of other federal and state or local authorities.

CHAPTER 1
GEOPHYSICAL OPERATIONS

Introduction

Geophysical operations may be conducted on most federal lands by bonded geophysical operators, regardless of whether the federal lands are leased.

Prior to conducting operations, the operator must contact the SMA. With prior approval, lessees may conduct geophysical operations on their lease as a lease right.

BLM Requirements

The responsibilities for geophysical operations on public lands are as follows:

Geophysical Operator

An operator is required to file with the BLM authorized officer a "Notice of Intent to Conduct Oil and Gas Exploration Operations" (Form 3040-1) and be apprised of practices and procedures to be followed prior to commencing operations on BLM-administered lands. The "Notice of Intent" shall include a map showing the location of the line, all access routes, and ancillary facilities. The map should be a minimum scale of one-half inch equal to one mile. A 1:24,000 U.S.G.S. topographic map is recommended. The party filing the "Notice of Intent" (named on the top of the Notice) shall be bonded. A copy of the bond or other evidence of satisfactory bonding shall accompany the Notice. Holders of statewide or nationwide oil and gas lease bonds may obtain a rider to include coverage of geophysical operations. For geophysical operation methods involving surface disturbance, a cultural resources survey may also be required.

The completion and signing of the "Notice of Intent" signifies agreement to comply with the terms and conditions of the Notice and subsequent practices and procedures specified by the Authorized Officer. A prework field conference may be conducted. Earth moving equipment shall not be used without prior approval. Upon completion of operations, including any required rehabilitation, the operator is required to file a "Notice of Completion of Oil and Gas Exploration Operations" (Form 3045-2).

Authorized Officer

The authorized officer shall contact the operator after the "Notice of Intent" is filed and apprise the operator of the practices and procedures to be followed.

The authorized officer shall complete a final inspection and notify the operator if the terms and conditions of the "Notice of Intent" have been met or that additional action is required. Consent to release the bond or termination of liability shall not be granted until the terms and conditions have been met.

FS Requirements

Geophysical operations on National Forest System lands are authorized under a Prospecting Permit issued by the FS. The sequence of actions by the geophysical operator and the FS authorized officer is as follows:

Geophysical Operator

The operator is required to file an application for a Prospecting Permit detailing all proposed operations on National Forest System lands. The application will include map(s) showing access routes and location of lines and all other activities. The map should be a minimum scale of one-half inch equal to one mile. A 1:24,000 U.S.G.S. topographic map is recommended. After the application has been reviewed by the FS, a permit will be sent to the applicant for review. The operator will sign and return the permit with any fee (if applicable) and bond requested.

The operator must have an approved Prospecting Permit prior to initiating operations on National Forest System lands and must comply with all stipulations. The operator must notify the authorized officer of scheduled entry and receive prior approval of any changes in the original plans. A prework conference may be required. For geophysical exploration methods involving surface disturbance, a cultural resources survey may also be required.

The operator is required to notify the authorized officer when operations are completed.

FS Authorized Officer

Upon receipt of the application, the FS will review the proposed activities to determine the stipulations necessary to protect surface uses and resources. The operator will be sent the resulting Prospecting Permit indicating the stipulations, any fee to be paid (if applicable) and amount of bond required.

The FS makes final inspections prior to approval of termination of the permit and release of bond.

State and Local Requirements

There may be State or local requirements for geophysical operations. It is the operator's responsibility to be aware of these requirements.

Other Federal SMA Requirements

The requirements of other Federal SMA's may vary. Authorization of the SMA is normally required prior to entry on the land.

Split Estate Minerals Administered by the BLM

Where the minerals are federally owned and the surface is private or state owned, no authorization is necessary from the Federal Government. Operators must work with the surface owner to obtain access.

CHAPTER 2
PROCEDURAL GUIDELINES FOR OIL AND GAS OPERATIONS

The summary on the following pages is provided to acquaint the operator with the basic procedures for approval of lease operations. The procedures are presented in chart form which summarize the federal agency requirements and responsibilities contained in Onshore Oil and Gas Order No. 1. It also contains a synopsis of the timeframe requirements and corresponding field activities associated with the federal and operators' responsibilities. The major actions are presented in relative order and time perspective to assist the coordination efforts of both the operator and Federal agencies.

Two procedure options, namely the Notice of Staking (NOS) and Application for Permit to Drill (APD) (see table below), are available to the operator for securing approval to drill. Although timeframes set forth in the regulations are the same for both options, they do contain individual advantages. The NOS system, if properly coordinated at the beginning of the action, may expedite final permit approval; however, the APD system is the most familiar to the oil and gas operators and often requires less upfront coordination effort. The choice is the operator's as to which option to use.

On National Forest System lands the FS has approval authority on the surface use plan of operations.

Access roads and pipelines located on federal surface outside of the leasehold or the unitized area, require a right-of-way (ROW) for BLM lands or a Road Use Permit or Special Use Permit (SUP) for FS lands. The NOS or APD for BLM land will be accepted as a ROW application for these offlease facilities and the application should, therefore, detail the entire development proposal. At the NOS or APD onsite inspection, the operator will be provided form 2800-14 (ROW/Temporary Use Permit) containing standard terms and conditions, and form 1323-2 (ROW cost recovery and fee determination record) for any involved ROWs on BLM land. Complete APDs involving a BLM ROW should include a signed form 2800-14 and any required ROW cost recovery fees. APD conditions of approval will also apply to ROW portions of the permit.

Bonding

Bonding is required (43 CFR 3104, 36 CFR 228 E) for oil and gas lease operations in order to indem-

nify the United States against losses associated with failure to meet royalty obligations, plugging wells not properly abandoned on a lease, and/or surface restoration and cleanup on abandoned operations. Bond coverage for operations is to be provided by the operator. The operator may post the bond itself, or obtain a consent of the surety under an existing lessee's bond or operating rights owner's bond, extending coverage under that existing bond to include such operations. The bond may be a surety or personal bond backed by cash, negotiable securities, Certificate of Deposit, or Letters of Credit in the minimum amount of $10,000. In lieu of a $10,000 lease bond, a bond of not less than $25,000 for statewide operations or $150,000 for nationwide operations may be furnished. When submitting APDs, operators should state the bond they will utilize. In extraordinary cases, the authorized officer may require additional bonding coverage. Bonded principals may request partial bond releases when portions of the abandonment or reclamation process are deemed complete by the authorized officer. Upon the completion of all leasehold abandonment and reclamation, the operator should notify the authorized officer.

	NOS OPTION	APD OPTION
Step I	Staking Notice Submitted	Application for Permit to Drill
Step II	Onsite Inspection	Onsite Inspection
Step III	APD Submission and Processing	APD Review and Processing

	APPROVED DRILLING PLAN
Step IV	Operations Conducted Under an Approved Plan
Step V	Production/Dry Hole-Subsequent Actions
Step VI	Abandonment

NOTICE OF STAKING PROCEDURES GUIDELINES (NOS OPTION)

	Step I Staking Notice	Step II Onsite Inspection	Step III APD Review and Processing
Operator Action:	1. Contact SMA prior to staking for potential conflicts and concerns. (Operator's option) 2. File Notice of Staking with BLM and SMA.	1. Arranges participation of drilling and dirt contractors, and if necessary, surveyors and archaeologist at inspection. To be scheduled by the BLM or Forest Service. 2. Participates in inspection, secures information for surface-use program or develops program onsite.	1. Prepares surface use & drilling programs. Incorporates onsite inspection information. 2. Files complete APD with BLM. 3. If necessary, files private surface agreement & archaeological report with SMA. 4. Files application for offlease permit with SMA, if other than BLM. APD serves as formal ROW application for BLM lands.
Federal Action:	1. Upon initial contact, SMA apprises operator of conflicts and concerns. 2. Upon receipt of NOS, schedules onsite inspection with operator. 3. BLM and SMA initiates environmental review. Posts notice of proposal action.	1. BLM/FS schedules and conducts inspection with operator, contractors and SMA. 2. BLM/FS apprises operator of requirements for a complete APD at onsite or within 5 days. 3. Identifies offlease ROW or other permit needs.	1. BLM & FS upon receipt of APD, reviews surface use and drilling programs for completeness. Returns incomplete APDs. 2. Completes environmental analysis and completes necessary documentation. 3. BLM consults with or obtains FS/SMA approval of surface-use program. 4. Completes conditions of approval. 5. APD and permits approved or rejected. 6. Ensure adequate bonding or surety to cover approved operations.
Field Activities:	1. Operator surveys and stakes well, access road and ancillary facilities prior to inspection.	1. Conduct onsite inspection. 2. Stake location of well site, roads, and ancillary facilities as agreed at onsite. 3. Operator secures cultural resource inventory, if required.	
Timeframe:	1. Onsite inspection to be scheduled within 15 days of NOS receipt.	1. Onsite inspection conducted within 15 days of receipt of NOS. 2. Furnish operator with additional requirements at the onsite or within 5 working days of inspection.	1. Operator submits complete APD within 45 days of inspection. 2. BLM advises operator within 7 days as to completeness of APD. 3. BLM processes complete APD and either approves or rejects within 10 days of receipt.

APPLICATION FOR PERMIT TO DRILL PROCEDURES GUIDELINES (APD OPTION)

	Step I Application for Permit to Drill	Step II Onsite Inspection	Step III Final APD Review and Processing
Operator Action:	1. Contacts SMA for potential land-use conflicts, areas of concern and permit needs. (Operator's option.) 2. Prepares APD (surface-use and drilling programs) and files with BLM. 3. Files for permits required by SMA. On BLM lands APD serves as rights-of-way (ROW) application.	1. Arranges participation of drilling and dirt contractors and others, as applicable. 2. Participates in the onsite inspection.	1. Corrects, revises and/or amends APD and permit applications, as needed. 2. Files revised and completed APD with BLM and permit application amendments with the SMA. 3. If necessary, files private surface agreement & archaeological report with SMA. 4. Files application for off-lease permit with SMA, if other than BLM. APD serves as formal ROW application for BLM lands.
Federal Action:	1. Upon initial contact, SMA apprises operator of conflicts or concerns and other permit needs. 2. Upon receipt of APD, BLM conducts preliminary review for completeness. 3. Posts Notice of Proposed Action 4. BLM sends surface-use plan to SMA. 5. Upon receipt of APD, BLM/FS schedules onsite inspection. 6. BLM/SMA initiates environmental analysis.	1. BLM/FS conducts onsite predrill inspection with operator, contractors and SMA. 2. Location of well, access road and facilities and construction standards agreed upon. 3. Additional permit needs identified. 4. Operator advised of any deficiencies in surface use or drilling programs and provided with additional requirements.	1. Upon receipt of any APD revisions, reviews for completeness and approvability. 2. Completes environmental analysis and prepares necessary documentation. 3. Consults with SMA or obtains FS approval of SUP and conditions of approval. 4. Completes conditions of approval. 5. APD and permits approved or rejected. 6. Ensure adequate bonding or surety to cover approval operations.
Field Activities:	1. Operator surveys and stakes well, access road and ancillary facilities for onsite inspection.	1. Conducts inspection. 2. Operator secures cultural resource inventory, if required.	
Timeframe:	1. BLM advises operator within 7 working days as to completeness of APD. 2. Onsite inspection to be scheduled within 15 days after receipt of complete APD.	1. Onsite inspection conducted within 15 days after receipt of complete APD. 2. Operator furnished with additional requirements onsite or within 5 working days of onsite inspection.	1. Operator submits complete APD within 45 days of inspection. 2. BLM advises operator within 7 days as to completeness of APD. 3. BLM processes APD and either approves or rejects within 30 days of receipt of a complete APD.

APPROVED DRILLING PLAN

	Step IV Operations Conducted Under Approved Plan	Step V Producer/Dry Hole Actions	Step VI Abandonment
Operator Action:	1. Conducts operations in accordance with approved plan etc. (See Chapter 3.)	1. Files Well Completion Report (WCR) and, if needed, proposed modification to the surface-use plan if well is productive. (See Chapter 3.)	1. Files Subsequent Report of Abandonment (SRA) following plugging of well.
	2. Files necessary reports and Sundry Notices.	2. Files Notice of Intent to Abandon (NIA) if well is dry hole or well no longer productive. Prepares abandonment plan for wells which do not have an approved abandonment plan.	2. Files FAN (Final Abandonment Notice) upon completion of reclamation and site is ready for inspection.
	3. Files monthly report of operations.	3. Participates in onsite inspection, if requested.	3. Applies for release of the period of bond liability, if appropriate.
		4. Files required reports & applications related to production oper. (e.g., 5 day start up notice: site security diagrams, etc.)	
Federal Action:	1. Conducts Compliance Inspections.	1. Reviews WCR/NIA and proposed plans.	1. Performs compliance checks of final reclamation.
	2. Reviews, and when applicable, approves Sundry Notices.	2. Conducts field review or requests joint field exam with operator and SMA, if needed. Develops conditions of approval or additional reclamation measures for abandonment.	2. Obtains FS approval of abandonment on FS lands.
		3. Requests information/revision of plans, as needed.	3. Approves final abandonment and release of bond liability, as appropriate.
		4. Prepares environmental documentation, if necessary.	
		5. Consults with SMA as to approvability of plan or obtains FS approval.	
		6. Approves or rejects plan.	
Field Activities:	1. Operator begins construction and drilling operations.	1. Field review or joint field exam conducted.	1. Operator completes all work and well site, road, etc., are reclaimed and ready for inspection.
	2. Federal agencies conduct compliance inspections.	2. Operator begins construction, completes well and installs production facilities.	2. Field inspection conducted by BLM and SMA
		3. Operator plugs well.	
		4. Operator initiates reclamation of well site, etc., in accordance with abandonment plan.	
Timeframe:	1. APD approval is valid for 1 year.	1. Required timeframes for various production related reports and applications are detailed in Chapter 3.	1. Files SRA within 30 days following completion of plugging.
		2. Review, approve or reject plans or applications normally within 30 days.	2. Final abandonment approval timeframe variable, usually 1 to 2 years, depending on acceptable revegetation.
			3. Inspection and bond release normally completed within 30 days (if final abandonment approved).

CHAPTER 3
SURFACE USE

Well Sites

Locations

To the extent permitted by the geologic target, the locations selected for well sites, tank batteries, pits, and pumping stations, etc., should be planned so as to minimize long-term disruption of the surface resources. Design and construction techniques and other practices should be employed that would minimize surface disturbance and effects on other resources, and maintain the reclamation potential of the site. The following guidelines can be used to assist in meeting these objectives and reduce the overall impacts from well sites and other construction areas.

Well sites should be located on the most level location available that will accommodate the intended use. The site layout should be oriented to conform to the best topographic situation given the geologic target and any safety considerations. However, safety considerations may be an overruling factor (such as operations in a hydrogen sulfide area). Steeply sloping locations which require deep nearly vertical cuts and steep, fill slopes should be avoided or appropriately mitigated. The location of the well site should also be reviewed to determine its effect upon the location of the access road. Advantages gained on a good well site or tank battery location may be negated by adverse effects of the access road location. A well constructed drillsite is shown in Photograph 1.

Photograph 1 - Properly Constructed Drillsite

Construction

Construction procedures must conform to the approved surface use plan of operations. Generally, all surface soil materials shall be removed from the entire cut and fill area and stockpiled. The depth of topsoil to be removed and stockpiled should be determined at the predrill inspection and should be stated either in the proposed surface use plan of operations or specified in the conditions of approval. Surface soil material stockpiles should be located to avoid mixing with subsurface materials during construction and reclamation. Stockpile locations should be located so wind and water erosion are minimized and reclamation potential is maximized.

Normally, excavation of the cut and fill slopes is guided by information on the slope stakes. Fills should be compacted to minimize the chance of slope failure. If appropriate, terraces can be used on cut and fill slopes to reduce land impacts, such as length of slope, to prevent excessive water accumulation and erosion. If excess cut material exists after fill areas have been brought to grade, the excess material will be disposed of or stockpiled at approved locations. Snow and frozen soil material shall not be used in the construction of fill areas and pits.

The area of the well pad that supports the drilling rig substructure should be level and capable of supporting the rig. The drill rig, tanks, heater-treater, etc., are not to be placed on uncompacted fill material. The area used for mud tanks, generators, mud storage, and fuel tanks, etc., should be slightly sloping to provide surface drainage from the work area. Runoff water from offsite areas should be diverted away from the well site by ditches, waterbars, or terraces above and below the cut slopes.

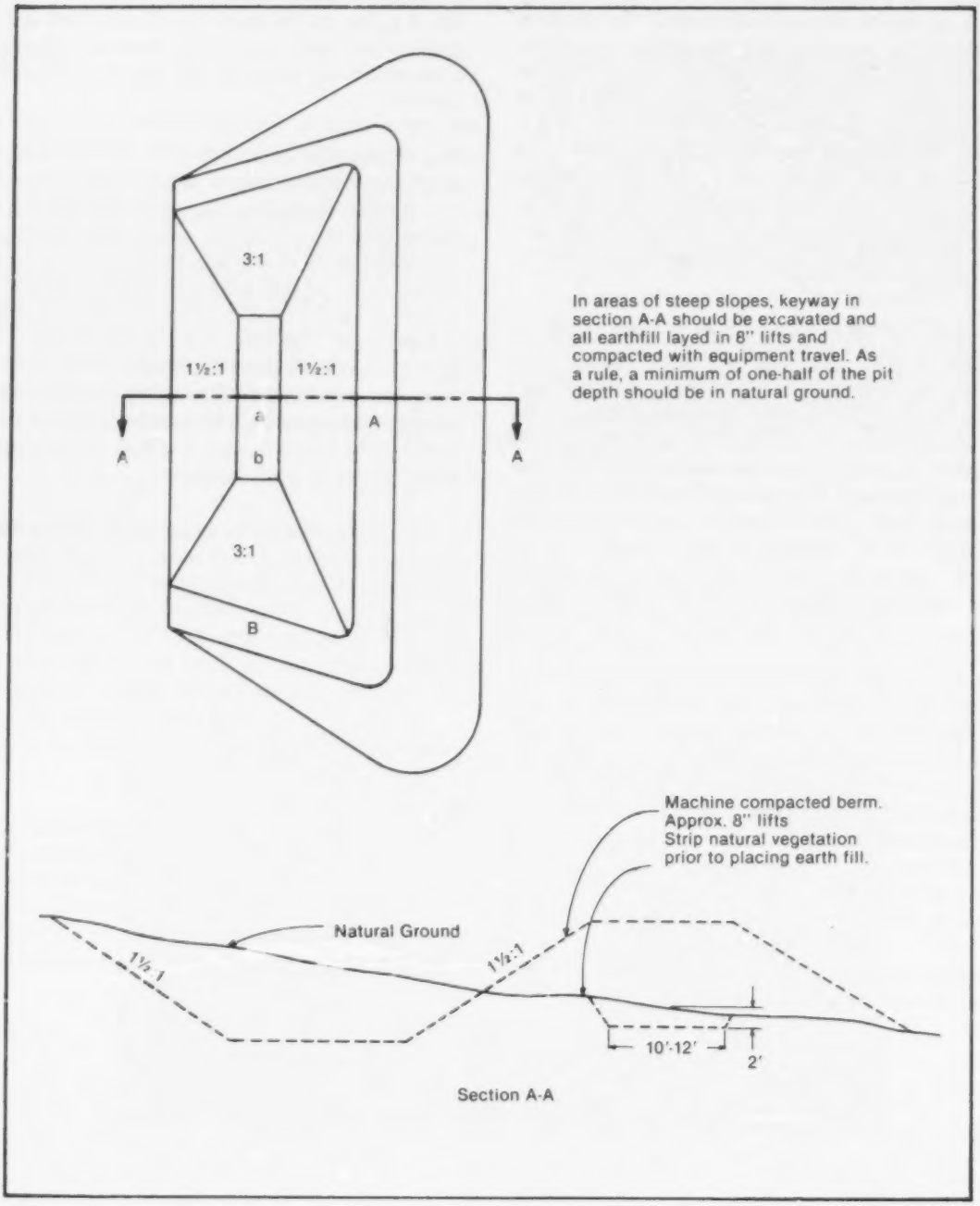
Reserve or "mud" pits are normally a part of a well site and are used for storage or disposal of water, drill mud, and cuttings. The reserve pit should be located in cut material. If this is not possible, at least 50 percent of the reserve pit should be constructed below original ground level to prevent failure of the pit dike. Fill dikes should be properly compacted in lifts (i.e., by rubber-tired construction equipment, sheeps foot roller, etc.). The necessary degree of compaction depends on soil texture and moisture content.

Pits improperly constructed on slopes may leak along the plane between the natural ground level and the fill. There is a significant potential for pit failure in these situations. When constructing impoundments by fill embankment, a keyway or core trench 10- to 12-feet wide should be excavated to a minimum depth of 2- to 3-feet below the original ground level. The core of the embankment is then constructed with water-impervious material. An alternative method of reserve pit construction on steeply sloping sites is to locate the pit on the drill pad next to the high wall. The pits are constructed totally in cut at such locations.

It may be necessary to line reserve pits to prevent contamination of ground water and soil. Bentonite, plastic, or other synthetic liners are most commonly used. In some environmentally sensitive areas, self-contained mud systems may be required with the drilling fluids, mud and cuttings being transported to approved offsite disposal areas. Fencing of reserve pits may be required to prevent access by persons, wildlife, or livestock. A plan of a typical, reserve pit is shown in Figure 1.

The operator's representative shall ensure compliance with all plans and designs. The representative should be designated prior to construction and have immediate access to an approved copy of all maps, drawings, templates, and construction standards and authority to order changes prior to initiating dirt work.

FIGURE 1. RESERVE PIT CONSTRUCTION



Roads and Access Ways

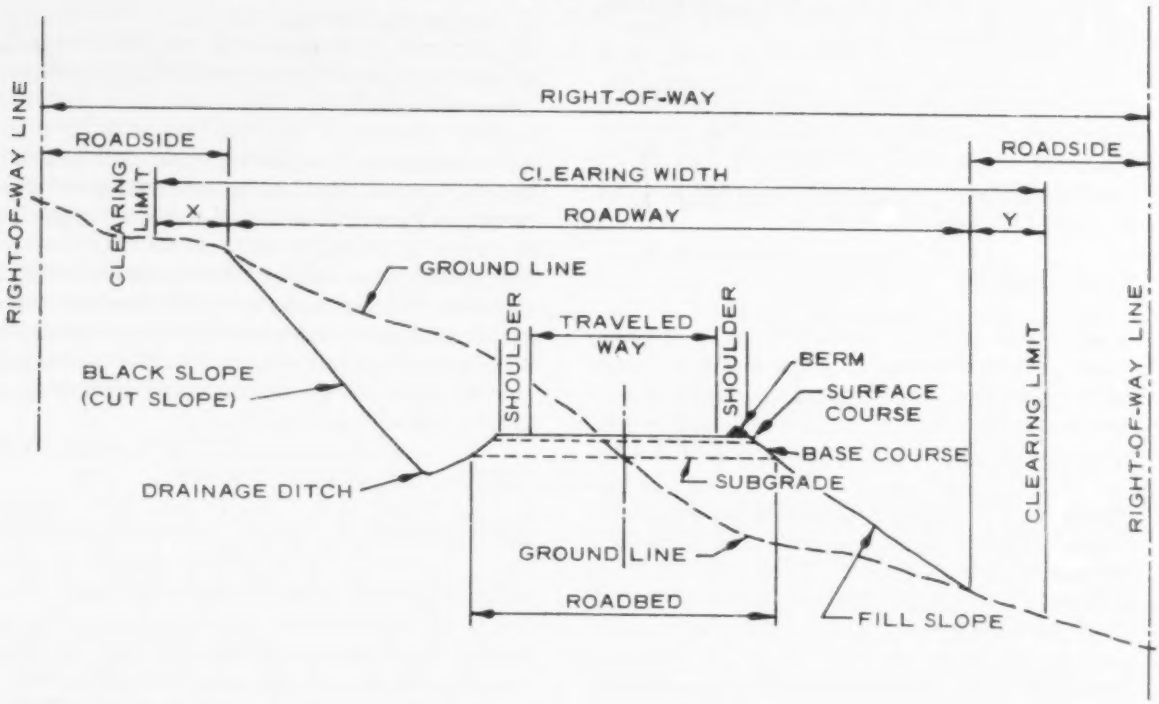
INTRODUCTION

These guidelines have been developed to provide oil and gas operators with BLM and FS policy and standards relative to planning, location, design, construction, maintenance and operation of roads and access ways on public and National Forest System lands. This chapter provides minimum guidelines. It is the policy of the BLM and FS that all permanent roads constructed by nongovernment entities across public or National Forest System lands must be designed by, or constructed under the direction of, a licensed professional engineer.

Special concerns such as steep slopes, erosion hazards, visual resources and other concerns require special consideration when roads and access ways are involved. In areas of high environmental sensitivity, special road location, design and construction techniques may be required. The operator is encouraged to contact local offices of the appropriate SMA prior to submission of an APD or NOS. This early contact will provide the operator with specific requirements and identify any special access needs.

Figure 2 illustrates commonly used terms in road design, and should be referred to when reviewing this chapter.

FIGURE 2. ILLUSTRATION OF COMMONLY USED TERMS IN ROAD DESIGN AND POTENTIALLY DISTURBED AREA WITHIN THE RIGHT-OF-WAY



NOTE; SHAPES AND DIMENSIONS WILL VARY TO FIT LOCAL CONDITIONS
SEE DRAWINGS FOR TYPICAL SECTIONS
X AND Y DENOTE CLEARING OUTSIDE OF ROADWAY

TRANSPORTATION PLANNING

The goal of transportation planning is to identify and analyze feasible alternatives for access which meet the objectives of the SMA and include the needs of users of federal lands. The planning process considers other resource values, public access needs, and future use of the road and avoids "leapfrogging" from one well site to another. Transportation planning can prevent the unnecessary expenditure of time and money and prevents unnecessary surface disturbance.

It is the policy of the BLM and FS that existing roads will be considered for use as access routes and may be used when they meet agency standards and transportation objectives. When access involves use of existing agency roads, operators may be required to contribute to road maintenance. Existing multiple use roads may be used by oil and gas operators when approved by the SMA, usually this is authorized by a joint use agreement in which each user's pro rata share of costs is based upon the anticipated use of the road.

Road locations and design criteria are developed to implement the goals of transportation planning. New road construction, or reconstruction, by the operator will be done to BLM/FS standards consistent with the needs of the users.

Road Location

Road location is the most critical stage for the engineering and environmental success of a road construction project. The surface and subsurface conditions of a road location largely determine the cost to survey, design, construct, and maintain a road.

Operators are strongly encouraged to contact the SMA about possible route locations before surveying and staking. Early SMA contact will inform the operator of any environmental concern that may affect road location.

The initial steps in road location are (1) determination of the intended use of the road, planned season of use, type of vehicles to be used, and road class, (2) examination of the SMA's transportation plan which may already have identified feasible routes for the area, and (3) examination of existing data, including maps and air photos, of administrative, biological, physical, and cultural conditions of the area.

Geotechnical Factors

The field reconnaissance of alternative routes should provide information on such factors as type of excavation, landslide areas, subgrade conditions indicating the need for surfacing, potential cut slope problems, surface or subsurface water problem areas, suitability of fill material, potential gravel pits or quarries for road aggregate, potential borrow and waste sites. A good road location analysis may avoid costly problems and identify cost-saving opportunities.

Other factors to be considered that are unique to the oil and gas industry include:

1. The prevailing wind direction in relation to the potential for encountering sour gas (H_2S) and the need for a clear escape route from the drillsite.

2. The potential for year-round operation: drill sites and producing locations may require all-weather access and special maintenance considerations for snow removal.

3. The potential for exploratory drilling to result in a producing operation. Usually the initial road alignments will be such that the road can be upgraded.

When the road location information is submitted to the SMA, the acceptability of the proposed route, and if applicable, alternative routes, can be evaluated. Final selection of the road location will be approved by the SMA at the predrill inspection or during final APD processing.

DESIGN AND CONSTRUCTION

Road Classes

BLM Temporary or FS Short-term Roads

These are low volume, single-lane roads built for a specific purpose or use. They normally have a 12-foot wide travelway and are located, designed, and constructed for temporary use. In many cases they may be constructed with little or no grading or blade use. They are usually built for dry weather use, but may be surfaced, drained, and maintained for all-weather use if the SMA concurs. Such roads

are to be made impassable to vehicle travel and returned to a near natural condition upon completion of use.

BLM Resource or FS Local Roads

These are low volume, single-lane roads, which may be reclaimed after a particular use terminates. These roads normally have a 12-14 foot travelway with intervisible turnouts. They are usually used for dry weather, but may be surfaced, drained and maintained for all weather use. These roads connect terminal facilities, such as a well site, to collector, local, arterial, or other higher class roads. They serve low average daily traffic and are located on the basis of the specific resource activity need rather than travel efficiency. They may be developed for either long- or short-term service and operated either closed or open to use as determined by the SMA.

BLM Local or FS Collector Roads

These roads may be single- or double-lane with travelways 12-24 feet in width, with intervisible turnouts. They are normally graded, drained, and surfaced and are capable of carrying highway loads. These roads provide access to large areas and for various uses. They collect traffic from resource or local roads or terminal facilities and are connected to arterial roads or public highways. The location and standard are based on both long-term resource needs and travel efficiency. They may be operated for either constant or intermittent service, depending on land use and resource management objectives for the area being served.

BLM Collector or FS Arterial Roads

These roads are usually double-lane, graded, drained and surfaced, with a 20-24-foot travelway. They serve large land areas and are the major access route into development areas with high average daily traffic rates. The locations and standards are often determined by a demand for maximum mobility and travel efficiency rather than a specific resource management service. They usually connect with public highways or other arterials to form an integrated network of primary travel routes and are operated for long-term land and resource management purposes and constant service.

DEFINITIONS

Design Criteria. Requirements that govern the selection of elements and standards for a road, such as resource management objectives, road management objectives, safety requirements, and traffic characteristics.

Design Elements. Physical characteristics such as the traveled way clearing limits, curve widening, slopes, and drainage characteristics.

Design Standards. Lengths, widths, and depths of design elements, such as 14-foot wide traveled way. The design terms are illustrated in Figure 2.

Design Vehicle. This is the vehicle that the road is designed to carry. Usually it is a low-boy, with dimensions and typical use patterns.

Critical Vehicle. At times a limited number of vehicles wider than the design vehicle may use the road. The travelway and shoulder width should be large enough to accommodate this occasional use, however, these vehicles will usually be unable to traverse the road at the design speed of the road.

DESIGN SPECIFICATIONS:

BLM Temporary or FS Short-term Roads

1. Design Requirements

a. Design speed is 15 miles per hour or less.

b. Travel width is normally 12 feet.

c. Recommended minimum horizontal curve radius, 100 feet. Where terrain will not allow 100 foot curve radii, curve widening is necessary. Specifications are available from SMA offices.

d. Normal road gradients should not exceed 8 percent except for short pitches of 300 feet or less. In mountainous terrain, grades greater than 8 percent may be allowed with prior approval of SMA.

e. Turnouts are generally naturally occurring, such as additional widths on ridges or other available areas on flat terrain.

f. Drainage must be provided over the entire road. Usually this is accomplished by use of drainage-dips insloping, and naturally rolling topography. Ditches and culverts may be required in some situations, but are not expected as the norm.

g. Generally, gravel surfacing is not required, but if all weather access is needed, it may be necessary.

2. Field Survey Requirements. These vary with topography, geologic hazard, or other concerns. Each SMA has survey requirements based upon the design requirements and concern specific to the area. The SMA should be contacted as early as possible to determine survey requirements. The following general requirements are imposed to control the work and produce the desired road:

a. A flagline is established along the construction route. Flags should be placed approximately every 100 feet, or be intervisible, whichever is less.

b. Construction control staking may be required depending on conditions of the site.

c. Culvert installations are located and flagged.

3. Construction.

a. Drainage Dips. Drainage dips are an integral part of temporary and short-term roads. They should be located and spaced according to directions of SMA for the locale. Construction of drainage dips is described and illustrated in Figures 5 and 6.

b. Construction Standards. Standards for each road are provided by the SMA. The operator is responsible for ensuring that each road is constructed according to plans and specifications approved by the SMA. The degree of construction control should complement the survey and design methods. Lower standard surveys and design may require more intensive construction control and inspection to assure acceptability of the end product. An inspector designated by the operator and acceptable to the SMA should be readily available during construction to provide quality control.

BLM Resource and FS Local Roads

1. Design Requirements.

a. Design speed 15 miles per hour.

b. Travelway width--minimum 12 feet with turnouts.

c. Recommended minimum horizontal curve radius, 100 feet. Where terrain will not allow 100-foot curve radii, curve widening is necessary. Specifications are available from appropriate SMA offices.

d. Normal road gradients should not exceed 8 percent except for pitch grades (i.e., 300 feet or less in length). In mountainous terrain grades greater than 8 percent may be possible with prior approval of the SMA.

e. Turnouts are required on all single lane roads (travelway of 12-14 feet). Turnouts must be located at 1,000-foot intervals or be intervisible, whichever is less.

f. Drainage control shall be ensured over the entire road through the use of drainage dips, insloping, natural rolling topography, ditch turnouts, or culverts. Culverts, drainage crossings, and other controls should be designed for a 10-year frequency or greater storm, with an allowable head of one foot at the pipe inlet.

g. Roadbed culverts should be used to drain inside road ditches when drainage dips are not feasible.

h. Surfacing with gravel should be required where all weather access is needed.

i. At times a limited number of oil field vehicles (critical vehicles) larger than the design vehicle may make occasional use of the road. The operator should consider these needs in road design.

2. Field Survey Requirements. These are the same as for Temporary and Short-term roads.

3. Design Drawings and Templates.

a. On slopes of 0-20 percent, where horizontal and vertical alignment can be worked out on

the ground, a plan and profile drawing may not be required. Standard templates, drainage dip spacing, culvert locations, and turnout spacing guides would be acceptable.

b. A plan and profile view would be the minimum drawing required on steeper slopes and in areas of environmental concern. This would identify grade, alignment, stationing, turnouts, and culvert locations.

c. Standard templates of road cross-sections and drainage dips are required for all Resource, Local, and higher class roads. Figures 2 and 3 illustrate these sections.

d. Additional information may be required in areas of environmental or engineering concern.

4. Construction: The lessee or operator's representative shall ensure compliance with all plans and designs. The representative should be designated prior to construction and have immediate access to an approved copy of all maps, drawings, templates, and construction standards and authority to order changes prior to initiating dirt work.

The operator must take all necessary precautions for the protection of the work and safety of the public during construction of the road. Warning signs must be posted during blasting operations.

a. Clearing and Grubbing: Clearing and grubbing will normally be required on all sections of the road. Exceptions would be allowed in areas of sparse, nonwoody vegetation.

All clearing and grubbing should be confined to a specified clearing width (see Figure 2) which is usually somewhat wider than the limits of actual construction (roadway). Branches of all trees extending over the roadbed should be trimmed to give a clear height of 14 feet above the roadbed surface. All vegetative debris must be disposed of as specified by the SMA.

b. Excavation: All soil material and fragmented rock removed in excavation is to be used as directed in the approved plan. Excess cut material shall not be wasted unless specified in the approved plan.

c. Roadbed Construction: Roadbed material should never be placed when the materials or the surface are frozen or too wet for satisfactory compaction. Equipment should be routed over the layers of roadbed material already in place to help avoid uneven compaction anywhere along the travel route.

Borrow material shall not be used until material from roadway excavation has been placed in the embankments, unless otherwise permitted. Borrow areas used by the operator must be approved prior to the start of excavation.

Roadside ditches should conform to the slope, grade, and shape of the required cross-section with no projections of roots, stumps, rocks, or similar debris. Side ditches must be excavated to a depth of one foot minimum below finished road surface. Backslopes on the road ditches should not be cut flatter than two to one. Drainage turnout spacing on these ditches should not exceed 500 feet; slopes greater than 5 percent would require closer spacing of turnout furrows (wing ditches or relief ditches).

BLM Local and FS Collector Roads

1. Design Requirements.

a. Design speed 15-25 miles per hour.

b. Traveled way minimum 12 feet (single lane), maximum 24 feet (double lane) with intervisible turnouts as may be required.

c. Recommended minimum horizontal curve radius 100 feet. Where terrain will not allow 100-foot curve radii, curve widening is necessary. Specifications are available from SMA engineering offices.

d. Maximum grades should not exceed 8 percent. Pitch grades for lengths not to exceed 300 feet may be allowed to exceed 8 percent in some cases.

e. All culverts must be sized in accordance with accepted engineering practices and any special environmental concerns. The minimum size culvert in any installation must be 18 inches. Drainage crossings and culverts should be designed for a 10-year frequency or greater storm.

f. Turnouts will be required on all single-lane roads. Turnouts must be located at 750-foot intervals or be intervisible, whichever is less. The length should not be less than 100 feet with additional 25-foot transitional tapers at each end.

g. Surfacing is required for all weather access. Aggregate size, type, amount, and application method would be specified by the local office of the SMA. Subgrade analysis may be required to determine load bearing capacities.

2. Field Survey Requirements. Generally, the survey requirements for these roads are similar to those for Short-Term and Resource roads. However, these roads are designed for higher average daily traffic (ADT) rates and greater speeds. Thus, in addition to flagline and culvert survey requirements, a transit survey with preliminary center line staking and cross-sectioning is usually required on steep terrain and in areas requiring special engineering. Specific survey requirements are available at the local office of the SMA.

3. Design Drawings and Templates.

a. Generally, a plan and profile view would be the minimum required drawings for this road class (see Figure 3). This would identify grade, location, stationing, turnouts, culvert locations, and drainage dip spacing.

b. Standard templates of the proposed road cross-section(s), (see Figures 2 and 3) and drainage dip design are required for these roads.

c. Additional information may be required in areas of environmental or engineering concern.

4. Construction.

a. Drainage dips, construction, and spacing is the same as for resource and forest local roads.

b. Culvert cross-drains should be used in lieu of drainage dips for road grades in excess of 10 percent. Culvert installation is discussed in the Drainage and Drainage Structure Section and is illustrated in Figures 7 and 8.

c. Construction standards are the same as given in the BLM Resource and FS Local Roads Section.

BLM Collector and FS Arterial Roads

1. Survey and Design Requirements.

a. Vertical, horizontal, and topographic data as well as significant features should be plotted on standard plan profile sheets to a scale of 1" = 100' or as otherwise directed by the SMA.

b. Plot "L" (layout) line along "P" (preliminary) line using the following design standards criteria:

1. Design speed 20 miles per hour minimum unless otherwise directed.

2. Travel width--minimum 20 feet, maximum 24 feet.

3. Minimum horizontal curve radius, 200 feet width unless shorter radius is approved.

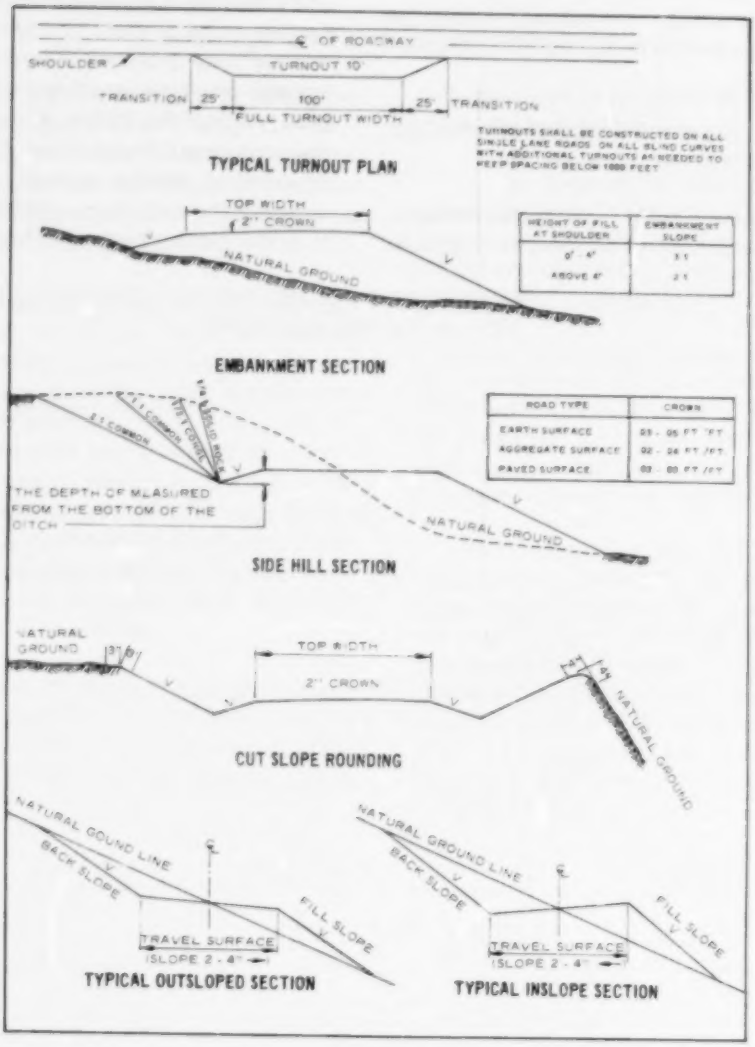
4. Design vertical curves for a maximum change of 2 percent per 50 feet of road length.

5. Maximum grade 8 percent (except pitch grades not exceeding 300 feet in length and 10 percent in grade).

6. Mass diagrams and earthwork balancing may be required. Obvious areas of waste or borrow shall be noted on the plan and profile as well as proposed locations of borrow or waste disposal areas.

7. All culverts would be designed for a minimum 25-year frequency storm with an allowable head of one foot at the pipe inlet. However, the minimum acceptable size culvert diameter is 18 inches. Show all culverts planned to accurate vertical scale on plan profile sheets.

FIGURE 3. CROSS-SECTIONS AND PLANS FOR TYPICAL ROAD SECTIONS. REPRESENTATIVE OF BLM RESOURCE OR FS LOCAL, AND HIGHER CLASS ROADS.



2. Design Drawings and Templates

a. Complete plan and profile drawings are required for any BLM Collector or FS Arterial road. (See Figure 4 for example.) These identify grade, location, stationing, and all culvert sizes and location. (See Figures 7 and 8 for examples).

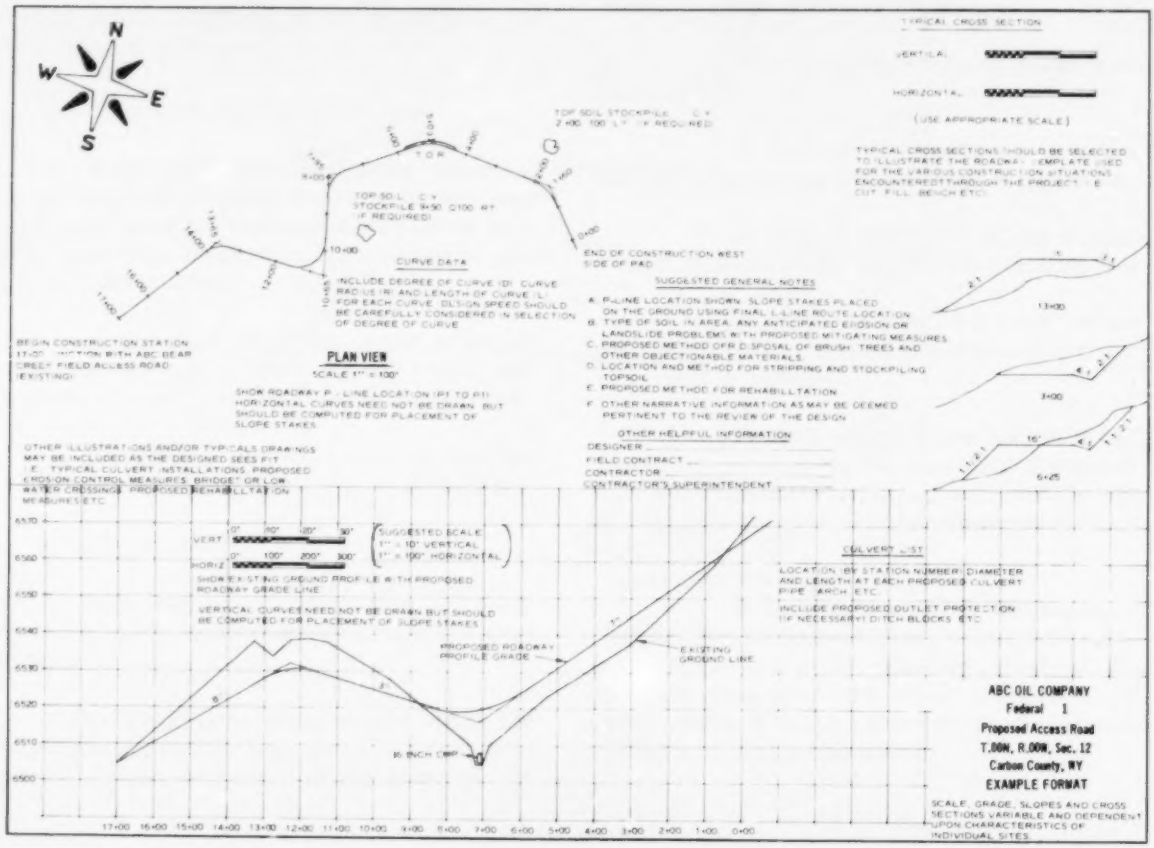
b. Standard templates of road cross-sections, drainage design, and culvert location and installation are required (see Figures 3 through 9 for examples).

c. Mass diagrams and materials investigation and classification may be required.

3. Construction. Except for the specific items provided below,construction standards are given in the BLM Resource/FS Roads or the BLM Local/FS Collector Roads Sections.

Excavation and fill construction will be performed to secure the greatest practicable degree of roadbed compaction and stability. Roadbed materials shall be placed parallel to the axis of the roadway in even, continuous, approximately horizontal layers not more than eight inches in thickness. The full cross-section of the fill must be maintained as each successive layer is placed. Place successive layers of material on embankment areas so as to produce the best practical distribution of the material. The materials throughout the roadbed shall be free from lenses, pockets, streaks, or layers of material differing substantially in texture, gradation, or compaction from the surrounding material.

FIGURE 4. TYPICAL ROAD PLAN AND PROFILE DRAWING
FOR AN OIL AND GAS ROAD



Ordinarily stones coarser than a three-inch square mesh opening should be buried at least four inches below the finished surface of the roadway.

The operator should route construction equipment over the layers of roadbed material already in place and shall distribute the gravel evenly over the entire width of the embankment so as to obtain the maximum compaction while placing the material and to avoid uneven compaction anywhere along the travel route.

Use excess excavation material, insofar as practical, to improve the road grade line or "flatten" fill slopes. Other waste areas must be approved prior to placement of waste material.

Drainage and Drainage Structures

The proper design and construction of structures for the drainage of water from or through the roadway often contributes the most to the long-term success of the structure and minimizes the maintenance and adverse environmental effects, such as erosion and sediment production.

Road Drainage Design. The most economical control measure should be designed to meet resource and road management objectives and constraints. The economic considerations shall include construction and maintenance costs. The need for drainage structures can be minimized by proper road location. However, adequate drainage is essential for a stable road. A proper drainage system should be the best combination of various design elements, such as ditches, culverts, drainage, dips, crown, in-slope or out-slope, low-water crossings, subsurface drains, and bridges.

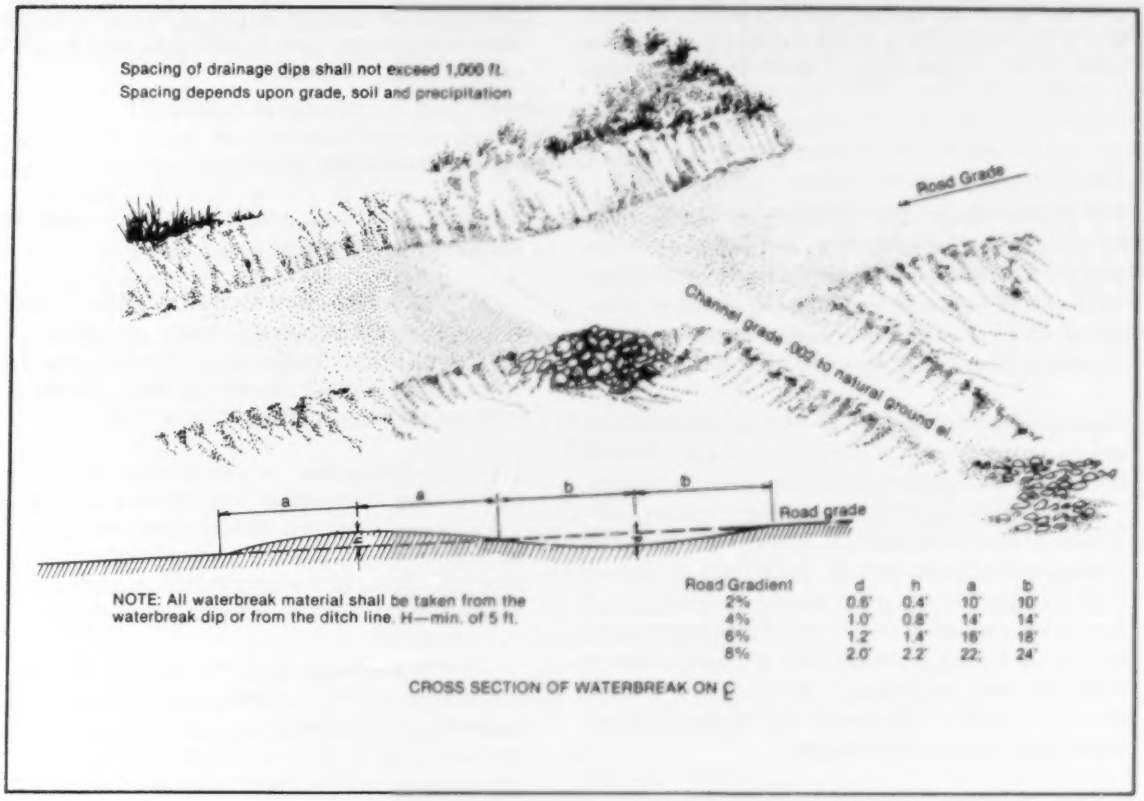
a. **Surface Drainage.** Surface drainage provides for the interception, collection, and removal of water from the surface of roads and slope areas. The design may need to allow for debris passage, mud flows, and water heavily laden with silt, sand, and gravel.

b. **Subsurface Road Drainage.** Subsurface drainage is provided to intercept, collect, and remove groundwater that may flow into the base course and subgrade, lower high water tables, and drain locally saturated deposits or soils.

Drainage Structures. Proper location and design can provide economical and efficient drainage in many cases. However, structural measures are often required to ensure proper and adequate drainage. Some of the most common structures are drainage dips, ditches, culverts, and bridges.

a. **Drainage Dips.** The primary purpose of a drainage dip is to intercept and remove surface water from the traveled way and shoulders before the combination of water volume and velocity begins to erode the surface materials. Drainage dips should not be confused with water bars which are normally used for drainage and erosion protection of closed or blocked roads. See Figures 5 and 6 for illustration and construction specifications.

FIGURE 5. DRAINAGE DIP ILLUSTRATION FOR SLIGHT TO MODERATE SLOPE FOR ACCESS ROADS


Spacing of drainage dips shall not exceed 1,000 ft.
Spacing depends upon grade, soil and precipitation
Road Grade
Channel grade .002 to natural ground el.
a
a
b
b
Road grade
NOTE: All waterbreak material shall be taken from the waterbreak dip or from the ditch line. H—min. of 5 ft.
CROSS SECTION OF WATERBREAK ON ℄

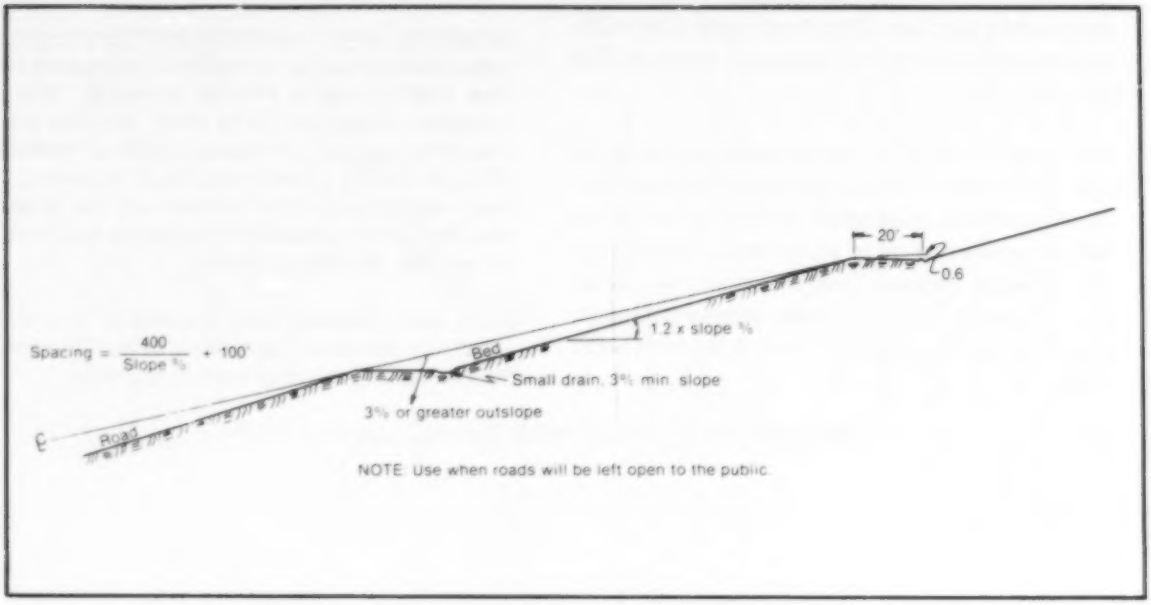
Road Gradient	d	h	a	b
2%	0.6'	0.4'	10'	10'
4%	1.0'	0.8'	14'	14'
6%	1.2'	1.4'	16'	18'
8%	2.0'	2.2'	22'	24'

Spacing of drainage dips depends upon local conditions such as soil material, grade, and topography. The SMA should be consulted for spacing instructions.

b. **Ditches.** The geometric design of ditches must consider the resource objectives for soil, water, and visual quality, maintenance capabilities and associated costs, and construction costs. Ditch grades should be no less than 0.5 percent to provide positive drainage and to avoid siltation. The types of ditches normally used are: drainage, trap, interception, and outlet.

c. **Road Crowning.** Roads which use crowning and ditching are common and can be used with all road classes. This design provides good drainage of water from the surface of the road. Drainage of the inside ditch and sidehill runoff is essential if the traveled way is to be kept dry and passable during wet weather. Snow removal becomes a simple task for common road maintenance equipment. Because the roadbed is raised, wind often blows the snow off the travelway. Photograph 2 illustrates a properly constructed and maintained, crowned and ditched road.

FIGURE 6. PROFILE VIEW OF BROAD BASED DRAINAGE DIP
USE FOR PERMANENT ROADS WHERE ROAD GRADIENT DOES NOT EXCEED 10 PERCENT



PHOTOGRAPH 2. A WELL-CONSTRUCTED AND MAINTAINED CROWNED AND DITCHED ROAD

Photograph 2 illustrates an example of a properly maintained roadway. The crown is well defined, the roadbed is smooth, and there is no disturbance outside of the roadway. This level of maintenance is much more cost efficient in the long-term due to reduced travel time, wear on vehicles, emergency road work, and driver fatigue.

d. **Culverts.** Culverts are used in two applications on oil and gas access roads; (1) in streams and gullies to allow normal drainage to flow under the traveled way, and (2) to drain inside road ditches. The latter may not be required if drainage dips are used.

The location of each culvert should be shown on the plan and profile or similar drawings submitted with the APD or ROW application. All culverts should be laid on natural ground or at the original elevation of any drainage crossed. Culverts should be placed on a 3 percent minimum grade; reverse camber is not allowed. See Figures 7 and 8 for installation details.

The outlet of all culverts should extend at least one foot beyond the toe of any slope. Culverts should be installed as shown in Photograph 3.

All culverts used in construction of oil and gas access roads should be concrete or corrugated metal pipe (CMP) made of steel or aluminum. Only undamaged culverts are to be used, and any culvert should be inspected for damage prior to installation. All spots on the pipes where the zinc coating has been injured should be painted with two coats of zinc-rich paint or otherwise repaired as approved by the surface managing agency.

Excavation, bedding and backfilling of culverts should be conducted according to requirements of the SMA and good engineering practices.

PHOTOGRAPH 3. ACCEPTABLE CULVERT INSTALLATION

FIGURE 7. DIAGRAMS FOR PROPER CULVERT INSTALLATION

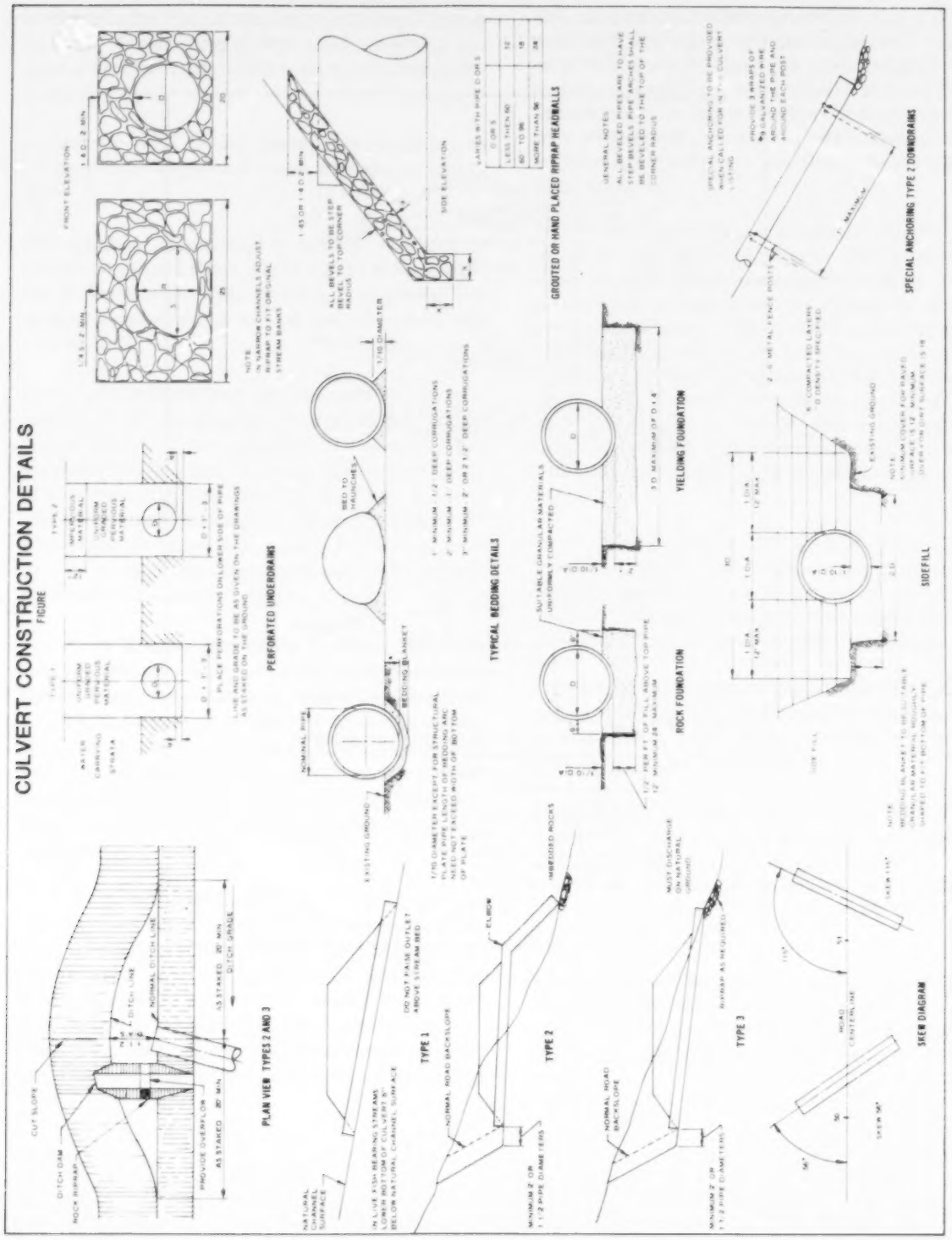
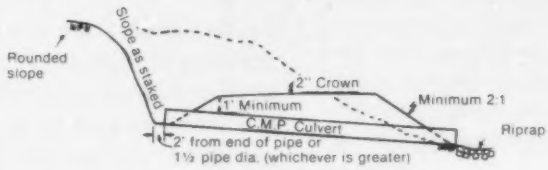


FIGURE 8. TYPICAL CULVERT CONSTRUCTION



C.M.P. CULVERT INSTALLATION

DITCH CONSTRUCTION AT SIDE HILL
C.M.P. CULVERT INSTALLATION

C.M.P. CULVERT INSTALLATION
EMBANKMENT SECTION

General Notes:

1. In bedding of C.M.P. Culverts, if the foundation is rock, excavate to depth of 8 in. below culvert grade and replace with earth cushion.
2. Minimum cover over culvert is one foot (1').
3. Minimum culvert diameter 18".
4. Minimum culvert spacing:
   (a) 1 - 2% grade--1000 feet minimum
   (b) 2 - 4% grade-- 800 feet minimum
   (c) 4 - 6% grade-- 600 feet minimum
   (d) 6 - 8% grade-- 400 feet minimum
   (e) 8 - 10% grade--250 feet minimum

e. **Ditch Relief Culverts.** Ditch relief culverts are installed to periodically relieve the ditch line flow by piping water to the opposite side of the road where the flow can be dispersed away from the roadway. The spacing of ditch relief culverts is dependent on the road gradient, soil types, and runoff characteristics.

A culvert with an 18-inch diameter is the minimum for ditch relief to prevent failure from debris blockage.

The depth of culvert burial must be sufficient to ensure protection of the culvert barrel for the design life of the culvert. This requires anticipating the amount of material that may be lost due to road use and erosion.

Ditch relief culverts can provide better flow when skewed 15 to 30 degrees downgrade from a line perpendicular to the centerline of the road This improves the flow hydraulics and reduces siltation and debris plugging the culvert inlet. Culverts placed in natural drainages can also be utilized for ditch relief. The design of culverts for later removal may be beneficial for intermittent use roads that will be closed for extended periods of time.

f. **Bridges and Major Culverts.** The BLM and FS Manuals require that all single or multiple culvert installations with end- or aperture-openings totalling more than 35-square feet have engineering approval at Regional or State Offices. This is also true of all bridge installations. Operators are encouraged to prepare applications requiring major culverts or bridges in sufficient time to allow for agency engineering evaluations.

g. **Wetland Crossings.** Wetlands are especially sensitive areas. Generally, these areas require crossings which prevent unnatural fluctuations in water level. Marshy and swampy terrain may contain bodies of water with no discernible current. The design of culverts for roads crossing these locations requires some unique considerations. Construction of some stream and wetland crossings may require a section 404, Corps of Engineers permit, in addition to the approval of the SMA.

The culvert should be designed with a flat grade so water can flow either way and maintain its natural water level on both sides. The culvert may become partially blocked by aquatic growth and should be installed with the flow line below the standing water level at its lowest elevation. Special attention must be given to the selection of culvert materials that will resist corrosion.

h. **Low-Water Crossings.** Roads commonly cross small drainages and intermittent streams. Here culverts and bridges are often unnecessary. The crossing can be effectively accomplished by dipping the road down to the bed of the drainage. Material moved from the banks of the crossing should be stockpiled near the right-of-way. Gravel, riprap, or concrete bottoms may be required in some situations. In no case should the drainage be filled so that water will be impounded. See Figure 9 for acceptable and unacceptable low-water crossings.

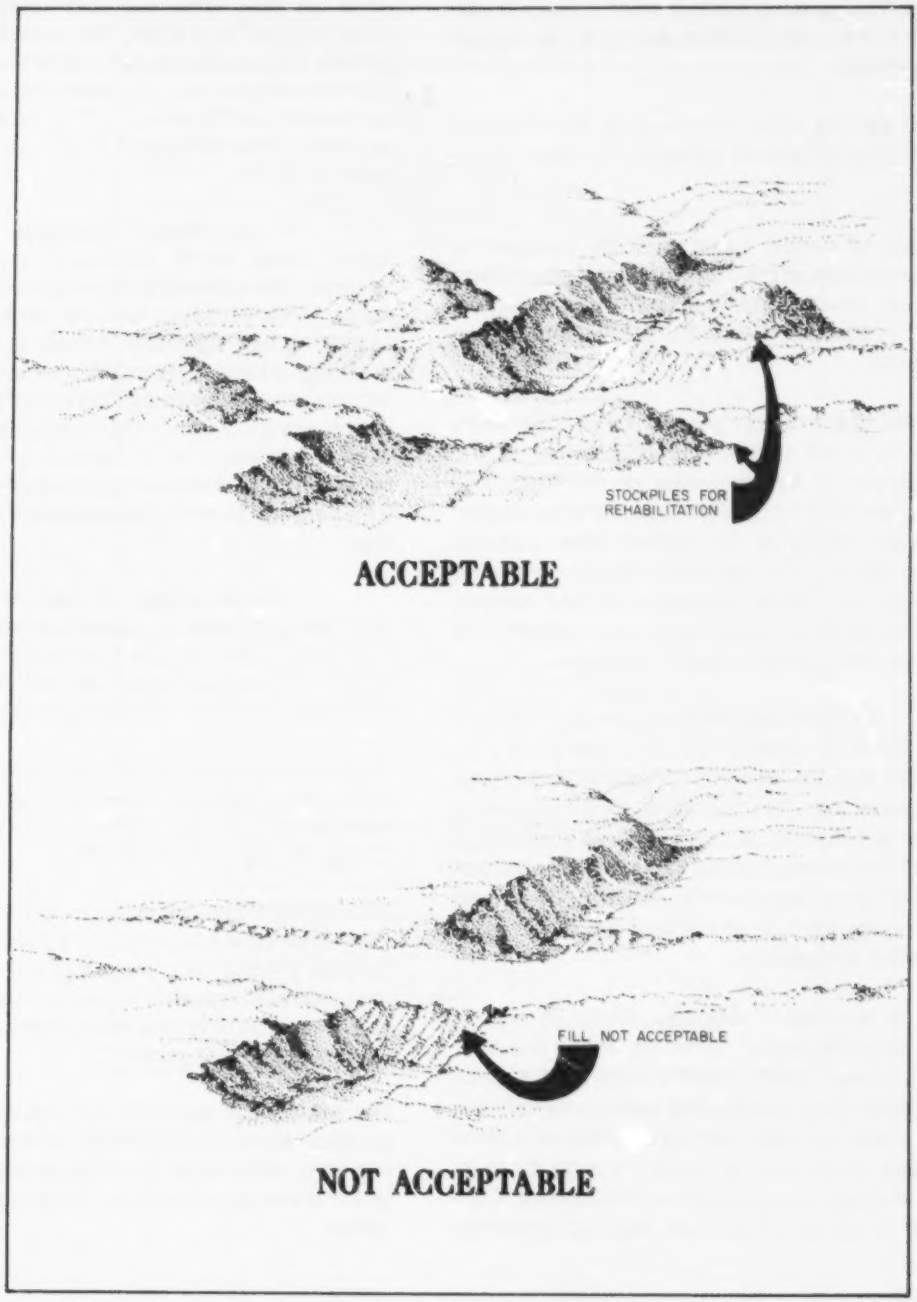
i. **Subdrainage.** If water is not removed from the subgrade or pavement structure, it may create instability, reduce load bearing capacity, increase possible damage from frost action, and create a safety hazard by freezing on the traveled way.

Perforated pipe drains and associated filter fabric or aggregate filters may be used when necessary to provide subdrainage. Other methods may be approved by the authorized officer.

Subdrainage systems may effectively reduce final road costs by decreasing the depth of basecourse needed, thereby reducing subgrade widths. This, in turn, results in less clearing and excavation. Maintenance savings may also be realized as the result of a more stable subgrade.

The solutions to subdrainage problems can be expensive. Road management techniques, such as reducing traffic loads or removing traffic until a subgrade dries out, should be considered as an alternative.

FIGURE 9. LOW-WATER/DRY CREEK DRAINAGE CROSSING



ROAD MAINTENANCE

Users may perform their share of road maintenance or may be required to deposit sufficient funds with the SMA to provide for their share. If the road has only one permitted user, other than incidental use, that user has the total responsibility for maintenance.

When required, the operator shall submit a road maintenance plan for all roads which will be constructed or used in conjunction with the drilling program. The maintenance plan will contain provisions for perpetuating the traveled way, protection of the roadway appurtenances, requirements for road management, and the method to be used in carrying out the maintenance activities. The activities normally required include: blading, surface replacement, dust abatement, spot repairs, slide removal, ditch cleaning, culvert cleaning, brush removal, litter cleanup, weed control, and snow removal. Specific areas shall be identified in the road maintenance plan for disposal of slide material, borrow or quarry sites, stockpiles, or other uses which are needed for the project.

PIPELINES AND FLOWLINES

Construction. Steep hillsides and water courses should be avoided in the location of pipelines and flowlines. Flowline routes should take advantage of road locations wherever practicable to minimize surface disturbance.

Blading of pipeline routes located on gentle topography should be limited to removal and smoothing of brush and surface irregularities, leaving most of the understory vegetation undisturbed. When clearing is necessary, the width disturbed should be kept to a minimum. Bladed materials should be placed back into the cleared route upon completion of construction. Surface soil material should be stockpiled to the side of the routes where cuts and fills or other surface disturbance occur during pipeline construction. Surface soil material should be segregated and should not be mixed or covered with subsurface material.

Pipeline trenches should be compacted during backfilling. These pipeline rights-of-way should be maintained in order to correct backfill settling and prevent erosion.

Pipeline routes should be graded to conform to the adjacent terrain. Cuts and fills on pipelines should be made only where necessary. After construction cut and fill slopes may need to be waterbarred or regraded to conform to the adjacent terrain.

Pipeline construction should not block, dam, or change the natural course of any drainage. Suspended pipelines should provide adequate clearance for runoff debris, wildlife, or livestock.

CHAPTER 4
DRILLING OPERATIONS

All proposed drilling operations and related surface disturbance activities, as well as any change from an approved Application for Permit to Drill (APD), must be approved before such activities are conducted. Approval will be in accordance with: (1) lease terms and conditions of approval, (2) 43 CFR 3160, (3) appropriate Onshore Oil and Gas Orders, and (4) Notices to Lessees (NTLs). For NFS lands, approval must also be in accordance with 36 CFR 228 E.

Initiating the Process

The process of obtaining approval to drill is initiated by filing either a Notice of Staking (NOS) or an APD. The choice of options is the operator's, but eventually a complete and acceptable APD must be filed. By filing a NOS, the operator triggers an onsite inspection prior to filing an APD and is then furnished appropriate surface use and reclamation requirements for incorporation into their APD. NOS or APD filing also triggers the mandatory BLM/FS 30-day public notification requirement. This may result in a more complete and readily approvable APD at an earlier time. There is no required form for a NOS but the informational requirements are specific. See Figure 12 for an example. If the APD option is selected, the onsite inspection is held after the filing of the APD with the BLM. The APD form is shown in Figure 13. When the lands involved are managed by a Federal agency other than the BLM, the NOS must be filed with the appropriate SMA ***and*** the BLM.

Surveying and Staking

Regardless of the option selected, the well location must be staked and access roads to be constructed flagged ***prior*** to the onsite predrill inspection. Surveying and staking may be done without advance approval from BLM or the SMA except for lands used for military purposes, Indian lands, or where significant surface disturbance is likely during the staking process. Operators are strongly encouraged to notify the SMA prior to entry to allow the SMA to advise them of difficult or problem conditions. With respect to private or state surface, the operator is responsible for making access arrangements with the surface owner prior to entry thereon (see Chapter 6).

Staking includes the well location, two 200-foot directional reference stakes, the exterior dimensions of the drill pad, reserve pit, other areas of surface disturbance, cuts and fills, and centerline flagging of new roads with road stakes being visible from one to the next. Cut and fill staking is required for the well site, reserve pit, and any ancillary facilities. Slope staking may subsequently be required for road locations on steep terrain, stream crossings, and for other environmentally sensitive locations.

Application for Permit to Drill (APD)

No drilling operations or related construction activities may be conducted without an approved APD. The APD must be approved by the authorized officer of BLM, in consultation with the SMA as appropriate. On National Forest System Lands, the FS must approve the surface use plan of operations of the APD. A complete APD consists of a drilling plan (comprised of a surface use program and a drilling program), evidence of bond coverage, and such other information as may be required by applicable Orders and NTLs (e.g., H_2S Contingency Plans where needed). Onshore Order No. 1 describes the specific informational requirements of the drilling plan. Operators are strongly encouraged to consult with the appropriate SMA as early as possible to identify potential concerns. Prior to beginning construction activities, the operator may be required to contact the BLM and appropriate SMA. Approved APDs are generally valid for 1 year.

Onsite Inspection - Environmental Review

An onsite, predrill inspection will normally be conducted within 15 days of BLM's receipt of a NOS, or an APD if no NOS was previously filed. The inspection team will include a BLM/SMA representative, the operator or agent, and other interested parties, such as the operator's principal dirtwork contractor and, if known, the drilling contractor. When the inspection is on private surface, the surface owner will be invited by BLM.

The purpose of the onsite inspection is to identify problems and potential environmental impacts associated with the proposal and methods for mitigating these impacts. The BLM/FS, with the assistance of any other involved Federal agencies, will complete the environmental analysis process.

Other Authorizations

The BLM approval of an APD does not relieve the operator from obtaining any other authorizations required for drilling or subsequent operations. This includes requirements of other Federal, State, or local authorities.

CHAPTER 5
PRODUCING OPERATIONS

General Operating Standards and Objectives

Onshore oil and gas lease operations are subject to applicable laws, regulations, lease terms, Onshore Oil and Gas Orders, NTLS, written orders, and instructions of the authorized officer. These include but are not limited to, conducting operations in a manner which ensures the proper handling, measurement, disposition, and site security of leasehold production; protecting other natural resources, environmental quality, life and property. The objective is to maximize ultimate recovery of oil and gas with minimum waste and with minimum adverse effect on ultimate recovery of other mineral resources.

Drilling and production reports are required to be submitted to Minerals Management Service (MMS) pursuant to their regulatory requirements (form MMS 3160).

Well Completion Report

A Well Completion or Recompletion Report and Log, Form 3160-4, is required to be filed within 30 days after completion of a well either for abandonment or production. The completion report is to reflect the mechanical and physical condition of the well. Geologic information and, when applicable, information on the completed interval and production is required.

Subsequent Well Operations

Producing wells in active oil and gas fields will periodically require repair and workover operations. Operations involving no new surface-disturbance to redrill, deepen, and plug-back require the submission and prior approval of the authorized officer of the BLM. And in some cases, these operations may require the approval of the FS. Proposals to perform casing repair, alter casing, perform nonroutine fracturing jobs, recomplete a different interval, perform water shut-off, commingling production between intervals and/or conversion to injection or disposal well, etc., will require the submission of a Sundry Notice (Figure 14) for prior approval of the authorized officer.

Unless additional surface disturbance is involved and if the operations conform to standard and prudent operating practice, prior approval is not required for routine fracturing or acidizing jobs, or recompletion in the same interval. A subsequent report of these operations must be filed on Sundry Notices and Reports of Wells, Form 3160-5 (Sundry Notice) or Form 3160-4 for recompletion within 30 days of completion of the operations.

No prior approval or subsequent report is required for well cleanout work, routine well maintenance, bottom hole pressure survey or for repair, replacement, or modification of surface production equipment provided no additional surface disturbance is involved.

Approval Procedures

When prior approval is required, the operator must submit a Sundry Notice, or APD, as applicable. With the appropriate form, a detailed written statement of the plan of work is to be provided to the authorized officer. When additional surface disturbance will occur, a description of any subsequent new construction, reconstruction, or alteration of existing facilities, including roads, damsites, flowlines and pipelines, tank batteries, or other production facilities on any lease, must be submitted to the authorized officer for environmental reviews and approval. On NFS lands the BLM will coordinate with the FS to obtain their approval on surface disturbing activities. Emergency repairs may be conducted without prior approval provided the authorized officer is promptly notified.

Production Startup Notification

Operators will notify the authorized officer no later than the 5th business day after any well begins production anywhere on a lease site or allocated to a lease site, or resumes production in the case of a well which has been off production for more than 90 days. The date on which a well commences production, or resumes production after having been off production for more than 90 days, is defined as follows:

1. Oil Wells. The date on which liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which liquid hydrocarbons are first produced into a permanent storage facility, whichever first occurs.

2. Gas Wells. The date on which associated liquid hydrocarbons are first sold or shipped from a temporary storage facility, such as a test tank, and for which a run ticket is required to be generated or, the date on which gas is first measured through permanent metering facilities, whichever first occurs. For purposes of this requirement, a gas well shall not be considered to have been out of production unless it is incapable of production.

Painting of Facilities

As specified in the Conditions of Approval (COA) of an APD, or a Sundry Notice for approval or modification of additional production facilities, a standard color may be specified. Standardized color charts are available from RMRCC member offices and most FS and BLM District offices.

Measurement of Production

If economically feasible, all oil, other hydrocarbons and gas produced from the leased lands are to be put in a marketable condition.

Oil production is to be measured by tank gauging, positive displacement metering system, or other methods acceptable to the authorized officer. In the absence of prior approval from the authorized officer, no oil is to be diverted to a pit except in emergency situations.

Gas production is to be measured by orifice meters or other methods acceptable to the authorized officer. The flaring/venting of gas from leasehold operations must meet the requirements of Notice to Lessees-4A, (NTL-4A) Royalty or Compensation for Oil and Gas Lost, or an applicable Onshore Oil and Gas Order.

Disposal of Produced Water

Produced water from leasehold operations will be disposed of by subsurface injection, lined pits or other methods acceptable to the authorized officer in accordance with the requirements of Notice to Lessees-2B (NTL-2B), Disposal of Produced Water, or an applicable Onshore Oil and Gas Order. Disposal of produced water by disposal/injection wells requires permit(s) from the primacy state or EPA. In some instances, an additional SMA authorization may be necessary. In most cases, water disposal pits should be fenced and flagged.

Pollution Control/Hazardous Waste

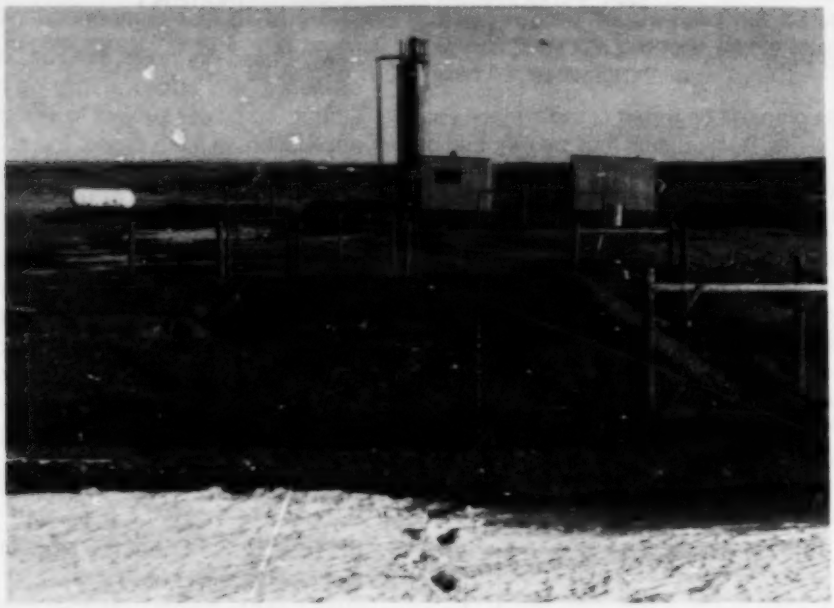
All spills or leakages of oil, gas, produced water, toxic liquids or waste materials, blowouts, fires, personal injuries, and fatalities shall be reported by the operator to the BLM and the SMA in accordance with the requirements of Notice to Lessees-3A, (NTL-3A), Reporting of Undesirable Events, or an applicable Onshore Oil and Gas Order. The BLM requires immediate reporting of all Class I events (more than 100 barrels of fluid/500 MCF of gas released or fatalities involved). Volumes discharged during any of the above incidents will be estimated as necessary. An example of the information normally required in reporting of spills, blowouts, fires, etc. is shown in Figure 15.

Firewalls/containment dikes are to be constructed and maintained around all storage facilities/batteries. The containment structure must have sufficient volume to contain, at a minimum, the entire content of the largest tank within the facility/battery, unless more stringent protective requirements are deemed necessary by the authorized officer. (See Photographs 4 and 5).

Inspection and Enforcement

The BLM and FS have developed procedures to ensure that leaseholds which are producing or expected to produce significant quantities of oil or gas in any year, or have a history of noncompliance, will be inspected at least once a year. Other factors such as health and safety, environmental concerns, and potential conflict with other resources also determine inspection priority. Inspections of leasehold operations are made to ensure compliance with applicable laws, regulations, lease terms, Onshore Oil and Gas Orders, NTLs, and other written orders of the authorized officer.

PHOTOGRAPH 4. TYPICAL ONSITE PRODUCED WATER DISPOSAL PITS



PHOTOGRAPH 5. TYPICAL PRODUCTION FACILITY FIREWALL

CHAPTER 6
RECLAMATION AND ABANDONMENT

Reclamation Plan

A reclamation plan will be a part of the surface use plan of operations. Reclamation may be required of any surface previously disturbed that is not necessary for continued well operations. When abandoning well and other facilities that do not have a previously approved reclamation plan, a plan should be submitted with a Notice of Intent to Abandon (NIA). Additional reclamation measures may be required based on the conditions existing at the time of abandonment. Any additional reclamation requirements would be made a part of the condition of approval of the NIA. The following are generally components of the reclamation plan.

Pit Reclamation

All pits must be reclaimed to a natural condition similar to the rest of the reclaimed pad area. In addition, the reclaimed pit must be restored to a safe and stable condition. In most cases, if it was necessary to line the pit with a synthetic liner, the pit should not be trenched (cut) or filled while still containing fluids (squeezed). Pits must be allowed to dry, be pumped dry, or solidified in situ prior to filling. The pit area should usually be mounded to allow for settling. The mounding will also allow for positive surface drainage off the reclaimed pit, to help lessen the leaching or lateral movement of undesirable substances from the wellpad area into surface streams or shallow aquifers.

The concentration of hazardous substances in the reserve pit at the time of pit backfilling must not exceed the standards set forth in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). All oil and gas drilling-related CERCLA hazardous substances removed from a location and not reused at another drilling location must be disposed of in accordance with applicable state and federal regulation.

Prior Approval of Abandonment

Well abandonment operations may not be started without prior approval of the "Sundry Notices and Reports on Wells," Form 3160-5, by the authorized officer. The Sundry Notice serves as the operator's Notice of Intention of Abandon (NIA). In the case of newly drilled dry holes, failures, and in emergency situations, oral approval may be obtained from the authorized officer subject to written confirmation by application. In such cases, the surface reclamation requirements will have been discussed with the operator and stipulated in the approved APD. Additional surface reclamation measures may be required. For older, existing wells not having an approved surface use plan of operations, a reclamation plan must be submitted with the NIA. Reclamation requirements will be made part of approval of abandonment. The operator must contact the BLM prior to plugging a well to allow for approval and witnessing of the plugging operations.

Revegetation

Disturbed areas should be revegetated after the site has been satisfactorily prepared. Site preparation may include ripping contour furrowing, terracing, reduction of steep cut and fill slopes, waterbarring, etc. The operator will be advised as to species, methods of revegetation and seasons to plant.

Seeding should be done by drilling on the contour whenever practical or by other approved methods. Seeding and/or planting should be repeated until satisfactory revegetation is accomplished, as determined by BLM/FS. Mulching, fertilizing, fencing, or other practices may be required.

Visual Resources

For all activities which alter landforms, disturb vegetation or require temporary or permanent structures, the operator may be required to comply with visual resource management objectives for the area. Site-specific practices may be required by BLM or FS.

Additional Guidelines

Supplemental guidelines and methods may be available that reflect local site and geographic conditions. These guidelines or methods may be obtained from the local BLM/FS office. Technical advances in reclamation practices are continually being developed that may be successfully applied to oil and gas construction practices.

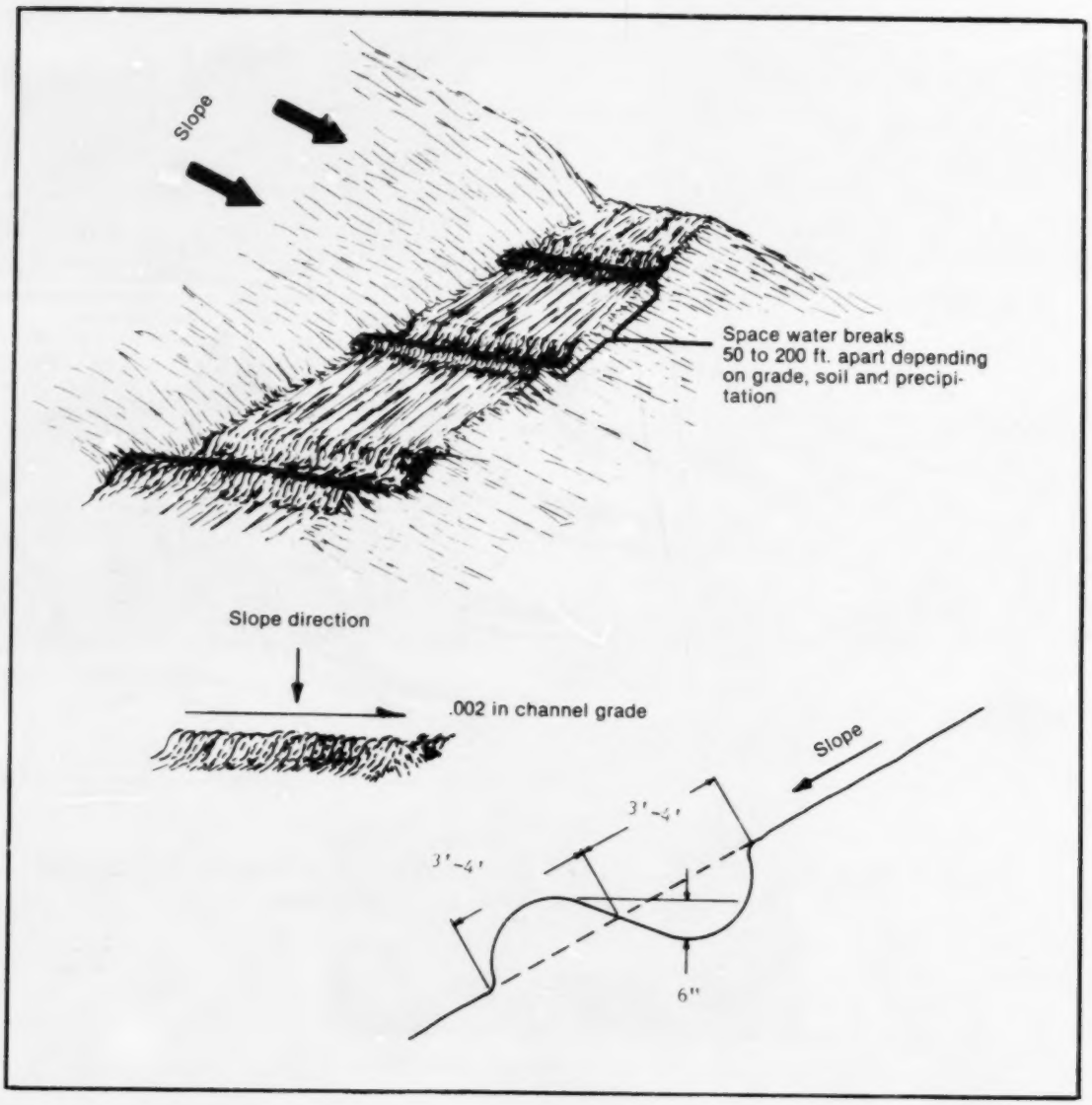
Pipeline and Flowline Reclamation

Reclamation and abandonment of pipelines and flowlines may involve replacing fill in the original cuts, reducing and grading cut and fill slopes to conform to the adjacent terrain, replacement of surface soil material, waterbarring and revegetating in accordance with a reclamation plan.

Pipeline trenches are to be compacted during backfilling and must be maintained to correct backfill settling and prevent erosion. Waterbars and other erosion control devices must be repaired as necessary. Pipeline routes shall not be used for roads unless they are properly constructed and authorized for such purposes.

Abandoned pipeline routes must be waterbarred as shown in Figure 10. Supplemental guidelines and methods may be available that reflect local site and geographic conditions. These guidelines or methods may be obtained from the local BLM/SMA office.

FIGURE 10. WATERBREAK CONSTRUCTION FOR PIPELINE AND BURIED CABLES



Well Site Reclamation

Reclamation Procedures: Recontouring involves bringing all construction material back onto the well pad and reestablishing the natural contours where desirable and practical. Figure 11 illustrates this type of restoration on a typical sidehill section. In recontouring areas which have been surfaced with gravel, the gravel is to be buried deep in the recontoured cut to prevent possible surface exposure.

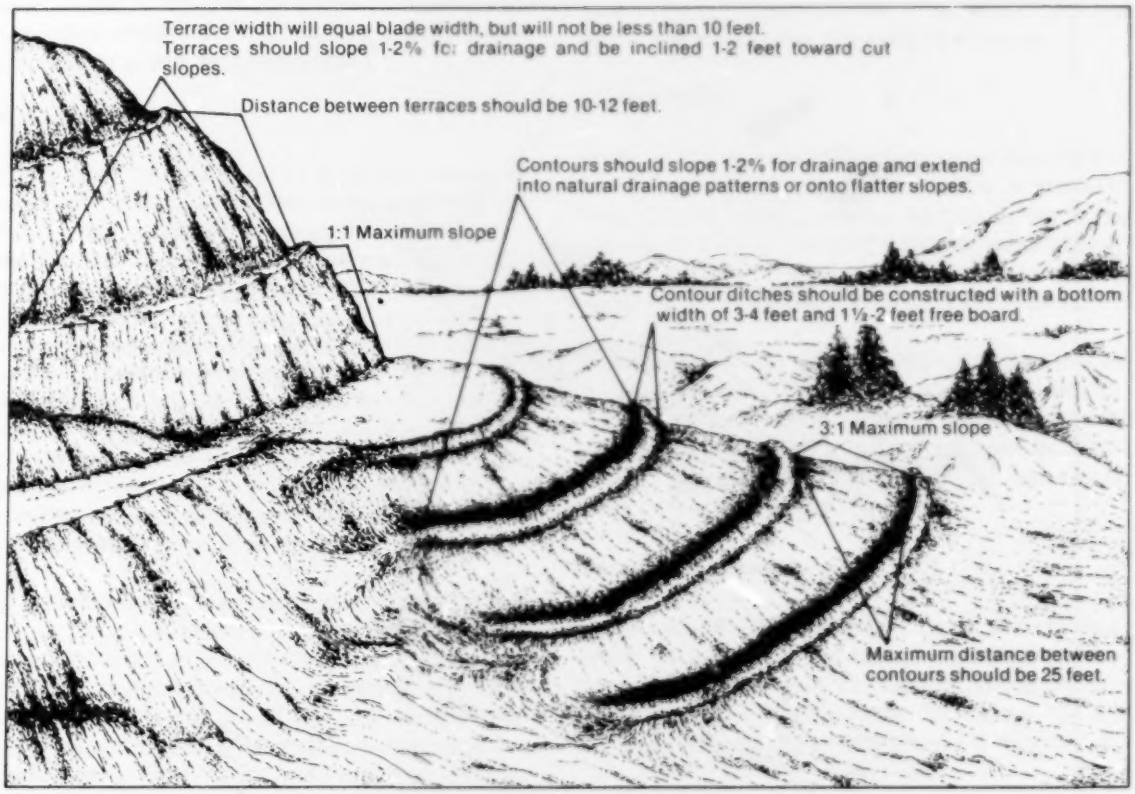

Terrace width will equal blade width, but will not be less than 10 feet.
Terraces should slope 1-2% for drainage and be inclined 1-2 feet toward cut slopes.
Distance between terraces should be 10-12 feet.
Contours should slope 1-2% for drainage and extend into natural drainage patterns or onto flatter slopes.
1:1 Maximum slope
Contour ditches should be constructed with a bottom width of 3-4 feet and 1½-2 feet free board.
3:1 Maximum slope
Maximum distance between contours should be 25 feet.

Figure 11. WELL SITE RESTORATION AND STABILIZATION BY TERRACING CUT SLOPES
Fill slope shows waterbreaks on reduced slope

Well site reclamation should be planned on both producing and abandoned well sites. The entire site or portion thereof, not required for the continued operation of the well, should be reclaimed. Final grading of backfilled and cut slopes should be done to prevent erosion and encourage establishment of vegetation. (See Photographs 6(A-E).)

Cut and fill slopes should be reduced and graded to blend the site to the adjacent terrain. The disturbed sites should be prepared to provide a seedbed for reestablishment of desirable vegetation and reshaped to blend with the natural contour. Such practices may include contouring, terracing, gouging, scarifying, mulching, fertilizing, seeding, and planting.

All excavations, pits, or drillholes should be closed by backfilling when they are dry and graded to conform to the surrounding terrain. Waterbreaks and terracing may be installed to prevent erosion of fill material.

PHOTOGRAPHS 6(A-E). WELL SITE RECLAMATION

A. Abandoned well site.

C. Slope reduction and installation of waterbreaks completed

B. Slope reduction on the well site.

D. Mulching of the well site.

E. Well site 1 year after revegetation.

Road Reclamation

Roads not on the SMA Transportation System shall be abandoned, closed, and obliterated. Reclamation of abandoned roads will involve one or more of the following techniques: (1) recontouring to the original contour; (2) recontouring to blend with natural contours; (3) recontouring only selected section of the roadway; and (4) obliteration of the roadway surface with no other modification of the profile.

PHOTOGRAPHS 7(A-B). COMPLETED RECLAMATION OF ROADBED.
ROADWAY RESTORED TO THE APPROXIMATE ORIGINAL CONTOUR AND REVEGETATED.

A. Roadway during use

B. Roadway after reclamation

Reclamation may include ripping, scarifying, waterbarring, and barricading. See Figure 10 for details on waterbreak construction. Stockpiled soil, debris, and fill materials should be replaced on the roadbed and cut slopes so as to conform to the approved reclamation plan.

Spacing of the waterbreaks is dependent on slope and soil type. For most soil types, the following table may be used for determining the space needed.

SLOPE	SPACING
2%	200 feet
2-4%	100 feet
4-5%	75 feet
+5%	50 feet

All disturbed areas should be revegetated where practical. Native perennial species, or other plant materials specified by the SMA, will be used.

Inspection

Final abandonment will not be approved until the surface reclamation work required by the APD or NIA has been completed and the required reclamation is acceptable to the SMA.

Water Well Conversion

In some instances, the SMA or private landowner may wish to acquire a well that has encountered usable fresh water. In those cases, requirements for abandonment may be modified. The operator will be reimbursed for any expenses incurred solely because the well is to be completed as a water well.

Final Abandonment Approval

The operator must file a Subsequent Report of Abandonment (SRA) following the plugging of a well. A Final Abandonment Notice (FAN) must be filed upon completion of reclamation operations which indicates that the site is ready for inspections. Upon receipt of the FAN, the SMA will inspect the site. A water supply well drilled in association with drilling an oil and gas well must be plugged and abandoned before the FAN is approved, if the water well is not acquired by the SMA or private landowner.

Release of Bonds

If the well is covered by an individual lease bond, the period of liability on that bond can be terminated once the final abandonment or phased bonding release has been approved. The principal can request termination of the period of liability from the State Office holding the bond. If the well is covered by a statewide or nationwide bond, termination of the period of liability of these bonds is not approved until final abandonment of all activities conducted under the bond have been approved.

CHAPTER 7
APPEALS

Administrative Relief (BLM)

State Director Reviews (SDRs) are conducted according to 43 CFR 3165.3. Appeals are processed according to 43 CFR 3165.4. All actions and decisions of the BLM pursuant to the oil and gas program as governed by 43 CFR 3160, and all Onshore Oil and Gas Orders and Notices to Lessees promulgated therefrom, are subject to SDRs, appeals, or both upon request. Note that before pursuing an appeal under this set of regulations, a SDR must be conducted first. SDRs apply to decisions related to APD conditions of approval or stipulations, inspection and enforcement actions, APD or Sundry Notices, etc. SDRs and appeals must be filed in the appropriate office according to the regulatory timeframes prescribed.

Forest Service Appeals

Forest Service appeals are conducted according to currently approved regulation. Decisions requiring FS consent or approval for use of National Forest System Lands are generally subject to appeal under these regulations subject to the additional provisions and limitations given in 36 CFR 228 E.

FIGURE 12. SAMPLE NOS SUBMITTAL

<table>
<tr><td colspan="2">NOTICE OF STAKING
Not to be used in place of Application for Permit to Drill (Form 3160-3)</td><td colspan="2">6. Lease Number</td></tr>
<tr><td colspan="2">1. Oil Well _____ Gas Well _____ Other (Specify)</td><td colspan="2">7. If Indian, Allottee or Tribe Name</td></tr>
<tr><td colspan="2">2. Name of Operator:</td><td colspan="2">8. Unit Agreement Name</td></tr>
<tr><td colspan="2">3. Name of Specific Contact Person:</td><td colspan="2">9. Farm or Lease Name</td></tr>
<tr><td colspan="2">4. Address & Phone No. of Operator or Agent</td><td colspan="2">10. Well No.</td></tr>
<tr><td colspan="2">5. Surface Location of Well</td><td colspan="2">11. Field or Wildcat Name</td></tr>
<tr><td colspan="2">Attach:
a) Sketch showing road entry onto pad, pad dimensions, and reserve pit.
b) Topographical or other acceptable map showing location, access road, and lease boundaries.</td><td colspan="2">12. Sec., T., R., M., or Blk and Survey or Area</td></tr>
<tr><td>15. Formation Objective(s)</td><td>16. Estimated Well Depth</td><td>13. County, Parish, or Borough</td><td>14. State</td></tr>
<tr><td colspan="4">17. Additional Information (as appropriate; shall include surface owner's name, address and, if known, telephone number)</td></tr>
</table>

18. Signed_____ Title_____ Date_____

Note: Upon receipt of this Notice, the Bureau of Land Management (BLM) will schedule the date of the onsite predrill inspection and notify you accordingly. The location must be staked and access road must be flagged prior to the onsite.

Operators must consider the following prior to the onsite:

a) H_2S Potential
b) Cultural Resources (Archeology)
c) Federal Right of Way or Special Use Permit

FIGURE 13. APD

Form 3160–3
(November 1983)
(formerly 9–331C)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004–0136
Expires August 31, 1985

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK — DRILL ☐ DEEPEN ☐ PLUG BACK ☐

b. TYPE OF WELL — OIL WELL ☐ GAS WELL ☐ OTHER — SINGLE ZONE ☐ MULTIPLE ZONE ☐

2. NAME OF OPERATOR

3. ADDRESS OF OPERATOR

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface

At proposed prod. zone

5. LEASE DESIGNATION AND SERIAL NO.

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME

9. WELL NO.

10. FIELD AND POOL, OR WILDCAT

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*

12. COUNTY OR PARISH | 13. STATE

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. unit line, if any)

16. NO. OF ACRES IN LEASE

17. NO. OF ACRES ASSIGNED TO THIS WELL

18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.

19. PROPOSED DEPTH

20. ROTARY OR CABLE TOOLS

21. ELEVATIONS (Show whether DF, RT, GR, etc.)

22. APPROX. DATE WORK WILL START*

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED _____ TITLE _____ DATE _____

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions On Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

FIGURE 14. SUNDRY NOTICE FORMS

Form 3160–5
(November 1983)
(Formerly 9–331)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Budget Bureau No. 1004–0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL ☐ GAS WELL ☐ OTHER
2. NAME OF OPERATOR
3. ADDRESS OF OPERATOR
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface
5. LEASE DESIGNATION AND SERIAL NO.
6. IF INDIAN, ALLOTTEE OR TRIBE NAME
7. UNIT AGREEMENT NAME
8. FARM OR LEASE NAME
9. WELL NO.
10. FIELD AND POOL, OR WILDCAT
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
12. COUNTY OR PARISH
13. STATE
14. PERMIT NO.
15. ELEVATIONS (Show whether DF, RT, GR, etc.)

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS: (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

18. I hereby certify that the foregoing is true and correct

SIGNED _____ TITLE _____ DATE _____

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

FIGURE 15. EXAMPLE SPILL REPORT DATA

To: (Appropriate BLM or FS Office) _____

From: (Oil & Gas Operator) _____

Subject: **Report of Undesirable Event** (NTL-3A; CDM 642.3.36)

Date of Occurrence:_____ Time of Occurrence:_____a.m., p.m.

Date Report to BLM:_____ Time Reported to BLM:_____a.m. p.m.

Date Report to FS:_____ Time Reported to FS:_____a.m. p.m.

Location: State_____ County_____

_____1/4_____1/4 Section_____T._____ _____, R. _____ _____; _____ Meridian

Operator: _____

Surface Ownership [FEDERAL (FS, BLM, Other), INDIAN, FEE, STATE]:

Lease Number: _____; Unit Name or C.A. Number_____

Type of Event: BLOWOUT, FIRE, FATALITY, INJURY, PROPERTY DAMAGE, OIL SPILL, SALTWATER SPILL, TOXIC FLUID SPILL, OIL AND SALTWATER SPILL, OIL AND TOXIC FLUID SPILL, SALTWATER AND TOXIC FLUID SPILL, GAS VENTING, OR OTHER (Specify) _____

Cause of Event:_____

Volumes of Pollutants I. Discharged or Consumed:_____

II. Recovered:_____

Time Required to Control Event (in hours):_____

Action Taken to Control the Event, Description of Resultant Damage, Clean-up Procedures, and Dates:_____

Cause and Extent of Personnel Injury:_____

Other Federal, State, and Local Governmental Agencies Notified: _____

Action Taken to Prevent Recurrence:_____

General Remarks:_____

Signature_____ Date_____

Title_____

FOR BLM OR FS USE ONLY

District_____ Date Reported to BLM or FS

Optional_____ Event Classification_____

Date of Onsite Inspection_____Remarks_____

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ACRONYMS USED IN THIS TEXT

ADT - Average Daily Traffic

APD - Application for Permit to Drill

BLM - Bureau of Land Management

CA - Communitization Agreement

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act of 1980

CFR - Code of Federal Regulations

CMP - Corrugated Metal Pipe

COA - Condition of Approval

EPA - Environmental Protection Agency

FAN - Final Abandonment Notice

FS - Forest Service

MLA - Mineral Leasing Act

NEPA - National Environmental Policy Act of 1969

NIA - Notice of Intention to Abandon

NOI - Notice of Intent

NOS - Notice of Staking

NTL - Notice to Lessee, National, State or District

POD - Plan of Development

RMP - Resource Management Plan

ROD - Record of Decision

ROW - Rights-of-Way

SDR - State Director Review

SMA - Surface Managing Agency

SN - Sundry Notice

SRA - Subsequent Report of Abandonment

SUP - Special Use Permit

SWD - Salt Water Disposal

UA - Unit Agreement

BLM/FS OFFICE LOCATIONS

LEGEND

- Forest Service Regional Boundaries
- Bureau of Land Management State Office Boundaries
- ▲ Forest Service Regional Headquarters
- * Bureau of Land Management State Offices
- Rocky Mountain Regional Coordinating Committee (RMRCC)

BLM STATE OFFICES

ALASKA STATE OFFICE
222 W 7TH AVENUE #13
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ARIZONA STATE OFFICE
3707 NORTH 7TH STREET
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(602) 241-5501

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2800 COTTAGE WAY, E-2841
SACRAMENTO, CA 95825-1889
(916) 978-4707

COLORADO STATE OFFICE
2850 YOUNGFIELD STREET
LAKEWOOD, CO 80215
(303) 236-1700

EASTERN STATES OFFICE
350 SOUTH PICKETT STREET
ALEXANDRIA, VA 22304
(703) 461-1400

IDAHO STATE OFFICE
3380 AMERICANA TERRACE
BOISE, ID 83706
(208) 334-1401

MONTANA STATE OFFICE
222 NORTH 32ND
BILLINGS, MT 59107
(406) 255-2904

NEVADA STATE OFFICE
850 HARVARD WAY
RENO, NV 89520
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NEW MEXICO STATE OFFICE
JOSEPH MONTOYA FED BLDG
SOUTH FEDERAL PLACE
SANTA FE, NM 87504-1449
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PORTLAND, OR 97208
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UTAH STATE OFFICE
324 SOUTH STATE STREET
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517 GOLD AVENUE SW
ALBUQUERQUE, NM 87102
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324 25TH STREET
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ATLANTA, GA 30367
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NOTES